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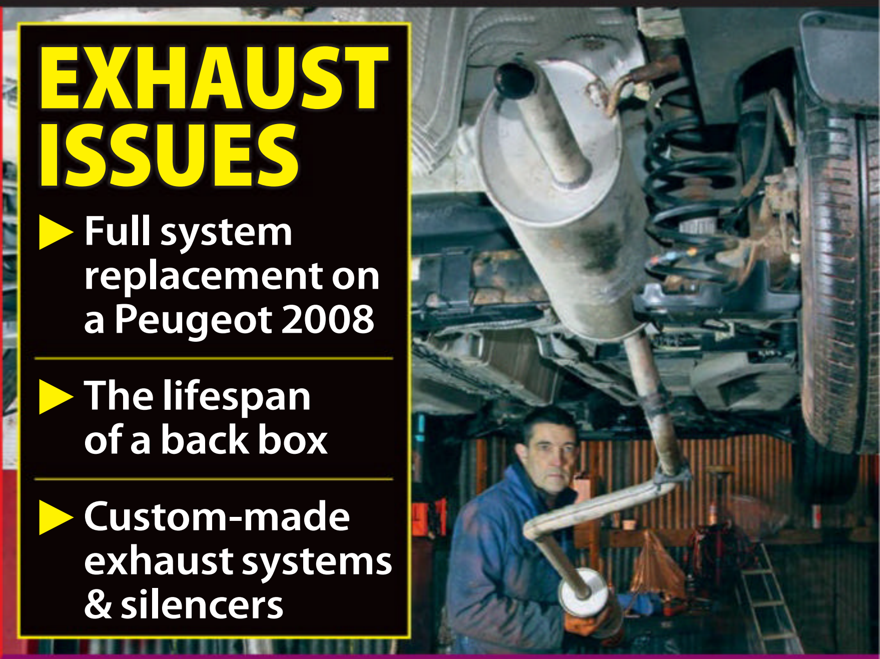

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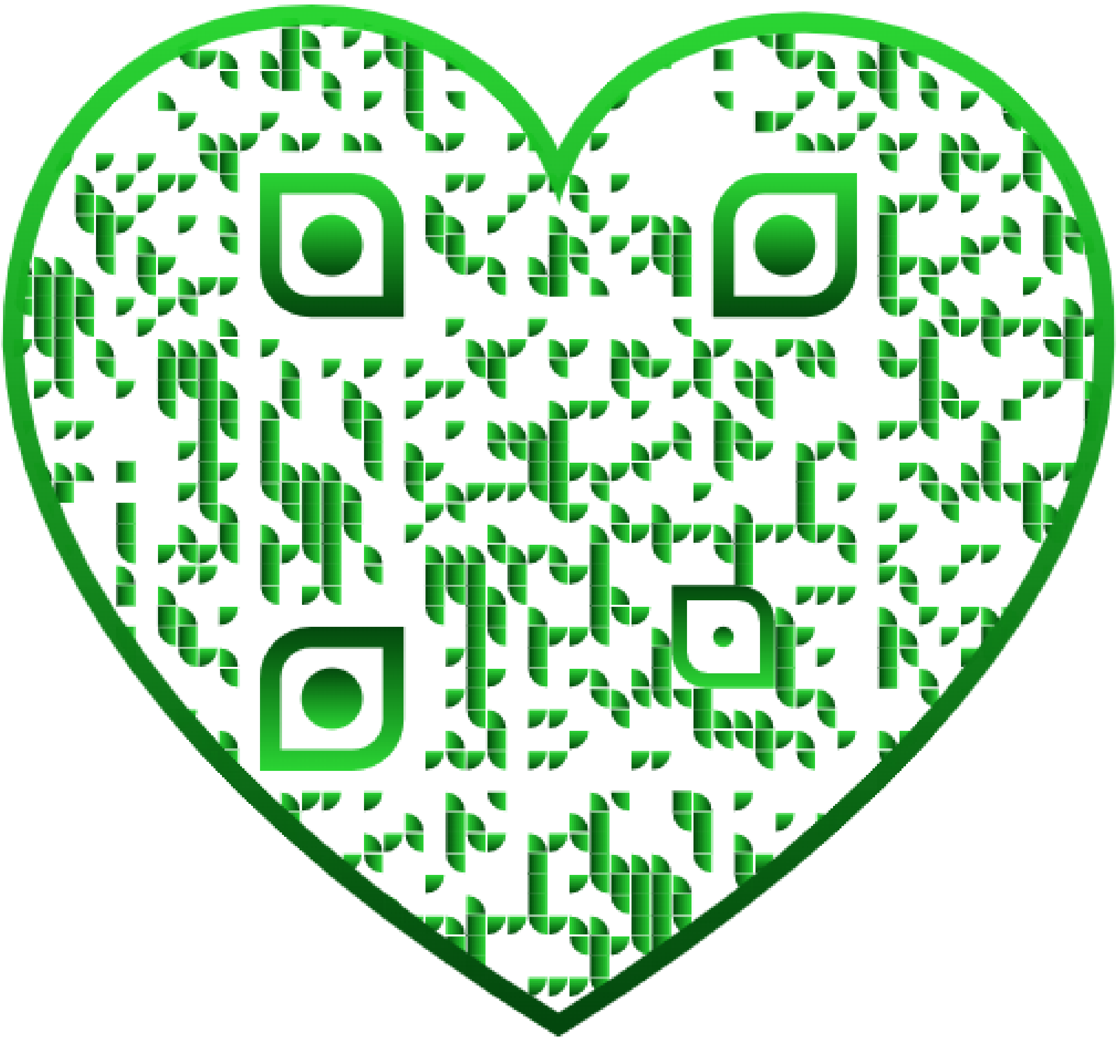

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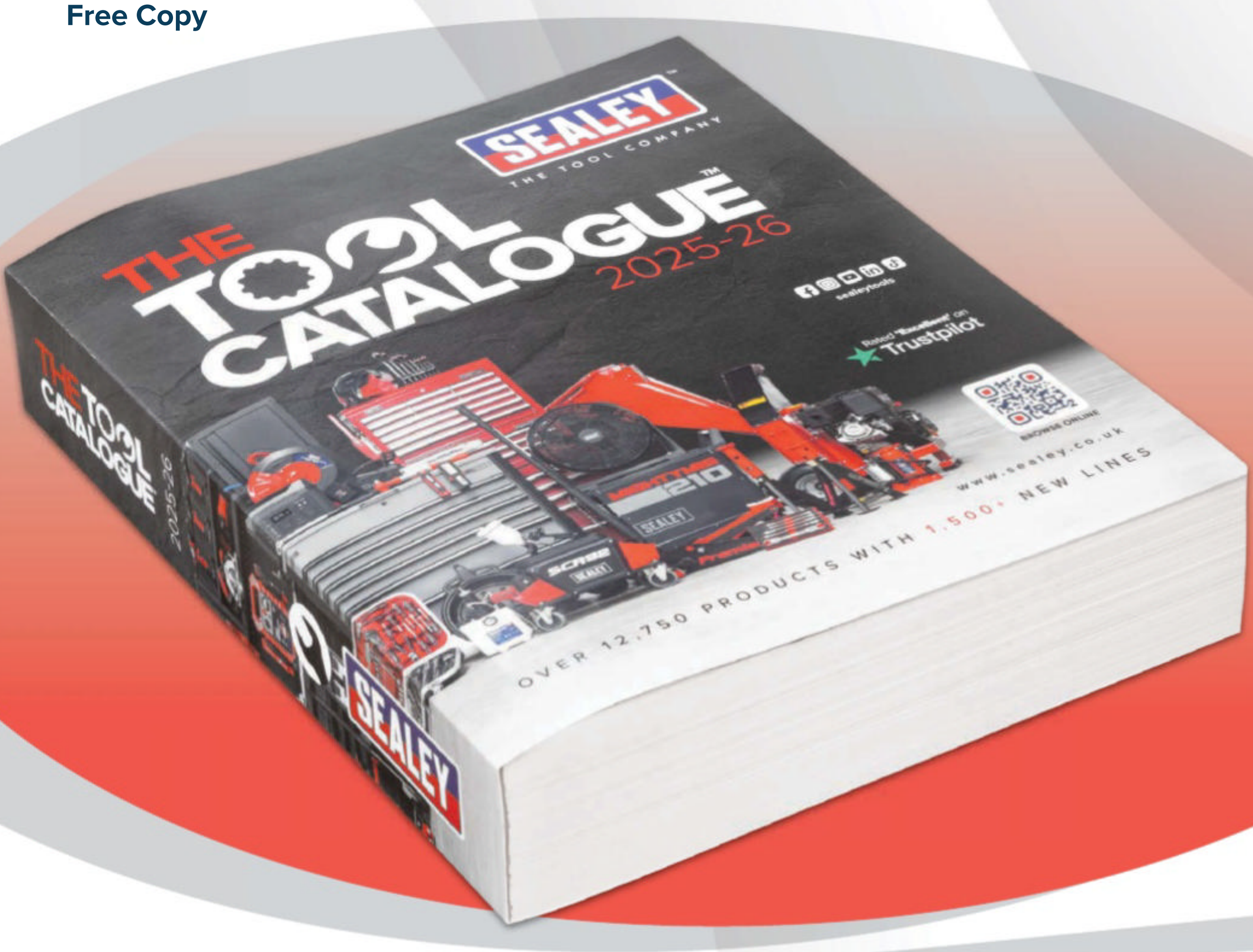
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Martyn Knowles, Editor
Email martyn.knowles@kelsey.co.uk
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Second-hand prices

After the COVID-19 spell, used cars sales hit an all-time high. Some motorists started watching motor-related YouTube videos during this period when we couldn't venture out, and many had the itching to buy a 'project' to do up and sell on. I know I did. With those few months of release between lockdowns, car sales improved in leaps and bounds.

Prices of second-hand vehicles increased too. I wish I'd fixed a few of mine and sold them a couple of years back because now, over these past two years, the used car market – although still buoyant – has seen sale prices reduce in most sectors. Which is great for anyone wanting to buy, but for those selling and unable to shift a particular model, the situation isn't so good.

Take our ex-project Lexus IS 250. We bought it from my local auction in June 2023 for £4750 + fees of £372. It had a CAP Clean price of £4600 at the time.

I should have sold the IS after 12 months, but my time was busy elsewhere. A polish of the bodywork was my main target as every panel had scratches. November 2024 I did spend a day and a half on the exterior. It looked good with the refurbished alloys and new Uniroyals.

It was decided to send it back to the local auction house in December. I was left open-mouthed when I asked the lady at the auction if she could give me the current CAP Clean price... £3300! Wow, in those 18 months from June 2023 to December 2024, we were looking at £1300 depreciation in the present market trend. We only added 2000 miles to the odometer in those 18 months.

HG10 KJV went into the Hall on a Friday afternoon sale – I was busy elsewhere so couldn't log into the 'live' sales. However, I did receive a call from the auction saying that someone had made a £1700 bid – what? I said we can't sell for that price; please put it back in for the next Friday sale. They did. I logged-in the following week and was pleased to see Hall bidders raise the price to £3400 + fees. Sold. They got a blooming good car for that price.

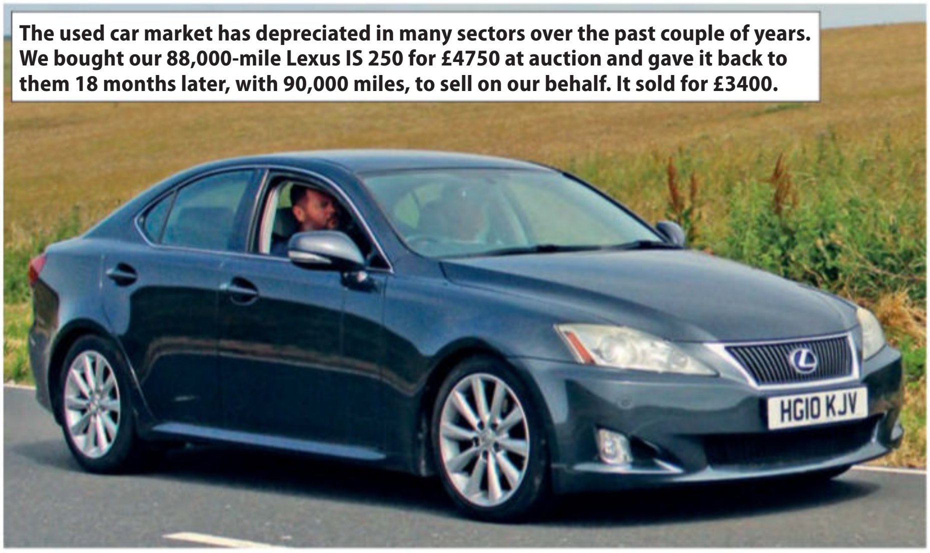
So, if you are in the market for a new-to-you vehicle, then hopefully the sale prices will be more pleasing than a couple of years ago. Plus look out for our August 2025 issue which will contain a *Bargain Buys Supplement* with extra pages. On sale from July 18th, it may help you decide if your current car is ready for a new owner.

Depreciation halted

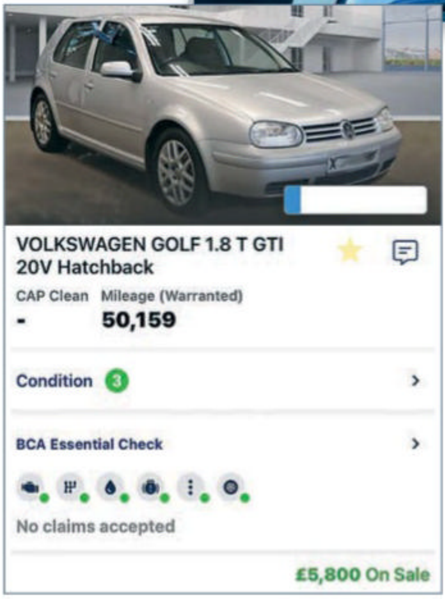
Saying that, not all models are depreciating so rapidly. Perfect, low-mileage, one owner offerings will see bids go way over guide price.

Last month, I watched the sale of a Volkswagen Golf Mk4 at British Car Auctions, thinking I may have a bid or two. It was the GTI 1.8T 20v 5-door model with just one owner since 2000 (X-plate), together with 50,159 miles on the clock and 12 main dealer service stamps – though, the last of those was in 2013.

How much do you think it sold for? I will tell you... £5800 + fees = about £6300. I didn't see that coming and didn't even bother with a bid.



The used car market has depreciated in many sectors over the past couple of years. We bought our 88,000-mile Lexus IS 250 for £4750 at auction and gave it back to them 18 months later, with 90,000 miles, to sell on our behalf. It sold for £3400.



VOLKSWAGEN GOLF 1.8 T GTI 20V Hatchback

CAP Clean	Mileage (Warranted)
-	50,159

Condition 3

BCA Essential Check

No claims accepted

£5,800 On Sale

The other end of the spectrum – a 2000 (W-plate) Peugeot 406 diesel with 439,000 miles to its name. The driver's seat still had that comfy, not worn, look to it. I thought there'd be no bids; and with no bids (£100 start) means a trip to the scrapyard. However, two punters bid with the 406 selling for £300 + fees.

Talking of old(er) cars, my 1989 Volkswagen Jetta Mk2 GTI 16v I owned for 24 years, featured in *Classics World* magazine over eight episodes. The guys managed to get it running and gained a fresh MOT certificate after 15 years off the road. I was offered the Jetta back, but declined... It sold at SWVA auction for £2350 + fees which I thought was a good buy for the purchaser. They have subsequently put the Jetta in their name and its MOT is due next week I believe.

Back to watching YouTube videos. I rarely watch normal TV these days. I subscribe to many car-related channels – one guy I've followed for a year or so now is Nino Rosella with his channel Not Economically Viable (NEV). He started out with a MINI Cooper S R53, repairing it in a parking spot outside his house during all weathers. The hook is that he isn't a trained mechanic – he admits to that. But on his endeavour to improve his knowledge of working on cars/vans, he has gone full-time with the channel – and started renting a commercial unit with a two-post ramp. Nino puts in the effort and edits his own videos. If you search for his NEV channel you will find him.

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CONTACT US

www.kelsey.co.uk

Car Mechanics, Kelsey Media, The Granary,
Downs Court, Yalding Hill, Yalding, Kent ME18 6AL.

Email: **cm.ed@kelsey.co.uk**

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EDITORIAL

Editor **Martyn Knowles**
email martyn.knowles@kelsey.co.uk
Technical Editor **Steve Rothwell**
email carmechanicshelp@yahoo.co.uk

CONTRIBUTORS

Alan Anderson, Jake Belder, Peter Clayton, Ian Cushway, Andrew Everett, Rob Hawkins, Mike Humble, Rob Marshall, Andrew Rolland, Peter Rosenthal, Peter Simpson

ADVERTISING SALES & PRODUCTION

Talk Media Sales
Account Manager **Natalie Excell**
Tel: **01732 445674**
email natalie@talk-media.uk
Ad Production **Nick Bond**
email nick@talk-media.uk
Tel: **01959 541444**

SUBSCRIPTIONS

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Customer service and subscription postal address
Car Mechanics Customer Service Team,
Kelsey Media, The Granary, Downs Court,
Yalding Hill, Yalding, Kent ME18 6AL

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MANAGEMENT

Managing Director **Phil Weeden**
Subscription Marketing Director **Gill Lambert**
Retail Director **Steve Brown**
Print Production Manager **Georgina Harris**
Print Production Controllers **Kelly Orriss** and **Hayley Brown**
Subs Marketing Exec **Dave Sage** and **Claire Aspinall**
Affiliate Marketing **Kate Chamberlain**

DISTRIBUTION

Distribution in Great Britain
Seymour Distribution Limited,
2 East Poultry Avenue, London EC1A 9PT
Tel: 020 7429 4000
www.seymour.co.uk
Distribution in Northern Ireland and the Republic Of Ireland
Newspread, Tel: +353 23 886 3850

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The Peter Simpson COLUMN

During a recent return trip to his hometown, Peter is singularly unimpressed by how the roads are being maintained…

▶ A couple of weeks ago, I made the first of my almost-traditional twice-yearly trips back to my hometown of Hastings in East Sussex. I was born and grew up in the town, and it was basically my home until 1985 when I left to seek my fortune in the world of motoring magazine journalism.

Despite being based in East Anglia since 1991, I've maintained strong connections with the town, and for many years was sort-of expecting to return at some point. That now seems less likely, though I do still enjoy going back, and because my early driving days were spent there, driving different cars on familiar roads is interesting.

It also provides pretty good evidence of just how much cars have progressed since the late 1970s. For example, just east of the town, on the main East-West A259 coast road there's a significant climb up and over the hills surrounding the town. When I started driving, my 1963 Austin A35 van (48bhp) had to drop into second gear to get over. By contrast, our 2014 Kia Sorento, with 197bhp on tap, takes it in its stride despite weighing over three times as much as the A35 did. Far from being slowed by the hill, it is more than capable of accelerating right up and over the top.

Sometimes however, I take a classic on the Hastings trip, and it's then very much a reminder of my earlier driving days. That was the case this time; part of the reason for the trip was to attend Peter Love's annual old-vehicle gathering at Bodle Street, so we went down in the Riley RMB. The trip down was pleasant even though it was dark by the time we hit the M25.

One other motorist, in a brand-new electric car, did seem to take exception to our presence, flashing aggressively from behind and then pulling alongside to shout something I could not hear. Thinking that my rear lights had failed, I pulled off. They hadn't. So, we carried on, and no-one else felt the need to complain. And that included a police traffic patrol car which glided past just after we'd joined the A21. Oh well, I'm sure Mr or Ms Flasher thought they were being helpful…

Driving the Riley around familiar roads was interesting. I never, of course, owned an RM during my time there. However, using it was a definite throwback to the A35, along with the succession of BMC Farina saloons I ran then. Once again, taking run-ups and changing down to get up hills were the order of the day, and because, like my original A35, the RM has mechanical rear brakes, I rediscovered the need to use engine braking. In this context, for those who aren't aware of South Lincolnshire's geography, I'll mention that we don't really have hills where I live.

But the most noticeable thing of all – and boy it was VERY noticeable – was just how awful the roads around Hastings are now. I thought Lincolnshire's were bad, but compared to Hastings', they're like bowling greens!

I've shown two photos. These were not taken on residential streets but the main A259 East-West coastal route along the Kent and Sussex coast between Folkestone and Emsworth in Hampshire. Just look at the state of it – I could have taken dozens of pictures of defects like this!

Contrary to popular belief, not all A-roads are the maintenance responsibility of central government. They maintain motorways and trunk roads, but not all A-roads are trunk roads. The trunk roads in East Sussex are the A21 outside Hastings, the A26 between Newhaven and the A27, the A27 and "most" of the A259 east of Pevensey but again excluding the section within Hastings. All roads within Hastings, and 90% of the roads network elsewhere in the county, is down to East Sussex County Council to look after.

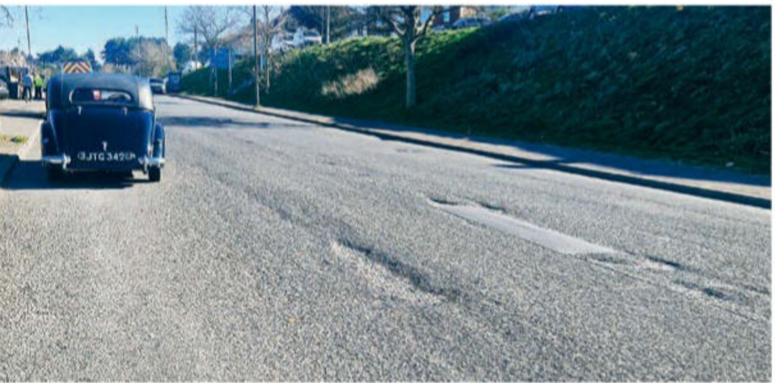
Since 2023, the ESCC roads maintenance contract has been held by Balfour Beatty Living Places. The seven-year contract (with the option for a further seven-year extension) covers roads, pavements, drainage, streetlights, traffic lights and bridges along with winter gritting and "highway improvement schemes."

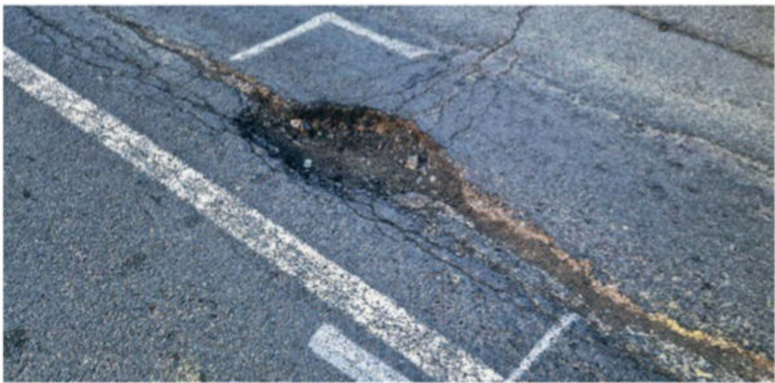
When Balfour Beatty took over, a lot of bold promises were of course made, including for a much-improved website for reporting defects. This also, however, includes, 'intervention level' information – in other words how quickly they aim to respond to defects of particular severity. This is very illuminating and actually rather disturbing. Potholes "greater than or equal to 100mm deep and at least 300mm wide in all directions" are supposed to be rectified within two hours.

And so they should be. Think about it – 100mm (10cms) deep and 30cms wide in both directions is massive! The smallest potholes for which a response time is quoted is 40mm to 60mm deep and 300mm in all directions, which have to be fixed within 28 days. Yes, they have up to a month to fix a pothole up to 59mm deep, so long as it's at least 30cms across in both directions. That's still very, very big, and more than capable of causing some very significant damage to wheels, steering and suspension. And if a pothole is only 29cms in either direction, then irrespective of how big it is in the other direction, or how deep it is, the contract does not provide any maximum response time whatsoever!

Now I don't know about you, but I really don't think any of this is acceptable. Britain's road network doesn't exist purely for the benefit of private motorists; it's a crucial and vital part of the nation's infrastructure and being able to move stuff and people around is crucial to our national economy. By letting the road network get into its current state, we're making economic growth much, much harder.

Local authorities are short of money these days, and it's of course true that things like education and adult social care are of greater importance than roads maintenance. But can we, as a nation which for all the right reasons is looking to grow our economy, really afford NOT to look after the most important parts of our internal transport network?





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HYDROGEN

FUTURE IMPERFECT

Asking whether hydrogen really is the saviour of automotive internal combustion, **Rob Marshall** delves into the current situation, including the maintenance requirements of hydrogen vehicles.

Carmakers have been experimenting with hydrogen cars for over 40 years and they are available to buy today. Yet, why have they not taken off?

Many people in Britain doubt whether their leaders are correct in their assertions that Battery Electric Vehicles are viable for our long-term personal transport needs. When asked why they feel so, the downsides of BEVs tend to be repeated: cost, weight, lack of charging infrastructure, human rights and environmental issues that are associated with battery/drivetrain production, battery lifespan, lack of qualified repairers, heavy depreciation, et al. Yet, when the sceptic is asked for an alternative, 'Hydrogen' tends to be touted as the answer. When queried about why, they cite that hydrogen is cleaner, cheaper, more efficient and provides more range per tankful. Such statements tend to be made with complete confidence. Yet, they tend to be wrong.

To discover more about hydrogen, how it compares with traditional fuels and the practical challenges, we turned to 'PHINIA' – a global company you might not recognise but you may be familiar with one of the firm's brands that is used most commonly on fuel injection systems and suspension/braking components: Delphi. Phinia is involved heavily with current car manufacturer hydrogen projects and has built up such a repute that it offers an IMI-accreditated Level 1 professional hydrogen qualification at the Delphi training centre in Leamington Spa, Warwickshire.

What is hydrogen?

'H' is a highly flammable gas that possesses atomic number '1' in the periodic table. Being both colourless and odourless, it is also the most abundant element in our universe: it is the fuel that powers our sun. Not only is it lighter but it also diffuses (moves) faster than any other gas. Due to hydrogen atoms' ability to bond easily with themselves, its natural state is as a gas and H_2 represents a pair of hydrogen atoms that have bonded together.

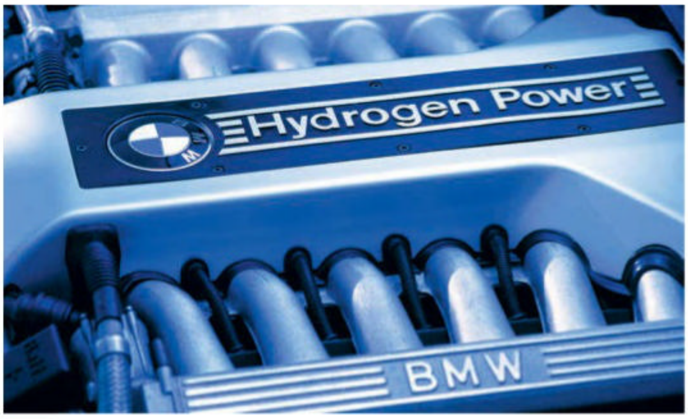
Hydrogen, therefore, appears to be the perfect sustainable fuel but there are problems. The main one is that hydrogen tends not to be found in isolation – its atoms tend to pair with other elements, too. For instance, water (H_20), ammonia (NH_3) and methane (CH_4). It requires a considerable amount of energy to split these bonds and capture H_2 to burn. Most commonly, the process of electrolysis is used, which involves passing large quantities of electrical current through water to release the hydrogen gas. This electrical energy must come from somewhere.

Further issues with hydrogen production are that the necessary processes of electrolysis, compression/liquidification and physical transportation are more wasteful, complex and less efficient than using electricity alone to recharge BEV batteries. The following stages give an overview of the history and current situation with using hydrogen as a sustainable fuel in motorcars.

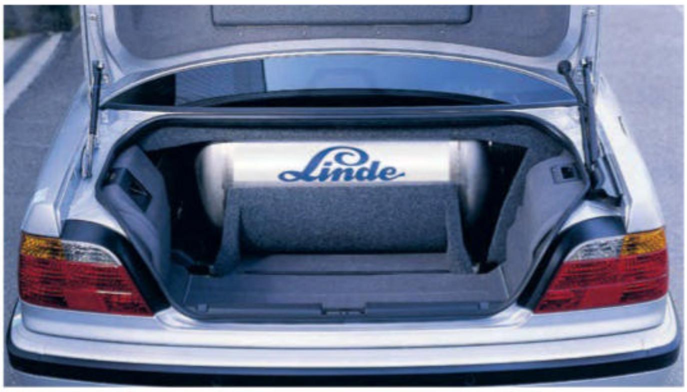
1 **Hydrogen prototype cars are nothing new. BMW has been experimenting with hydrogen since 1979, starting with the E12 5-series saloon.**

2 **By 2001, BMW introduced the 745h; the first small series production hydrogen car. Yet, this press picture portrays hydrogen as a clean fuel – which is only possible if the electricity for splitting the hydrogen atoms comes from renewable sources. In 2021, barely 1% of global hydrogen output was produced using renewables.** ***(Source: International Renewable Energy Agency).***

CleanEnergy

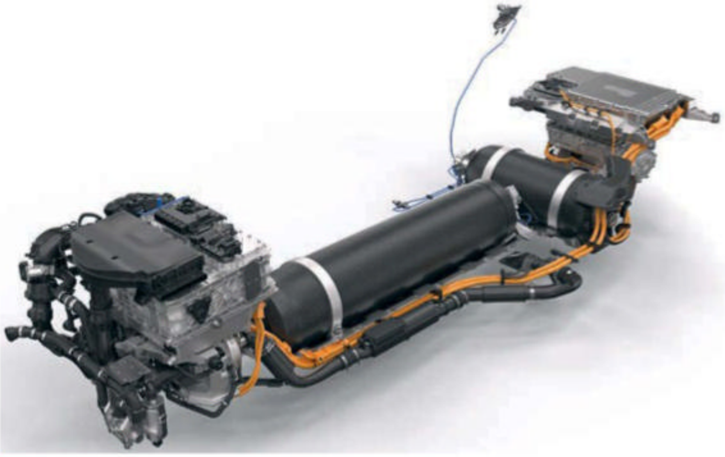


3 Even so, the BMW 745h showcased one way of burning hydrogen: using the traditional combustion engine. It generated 204 horsepower, whereas the standard model could manage 326 horsepower using the same engine, thus highlighting the reduction in energy density that gaseous hydrogen possesses, compared with petrol.

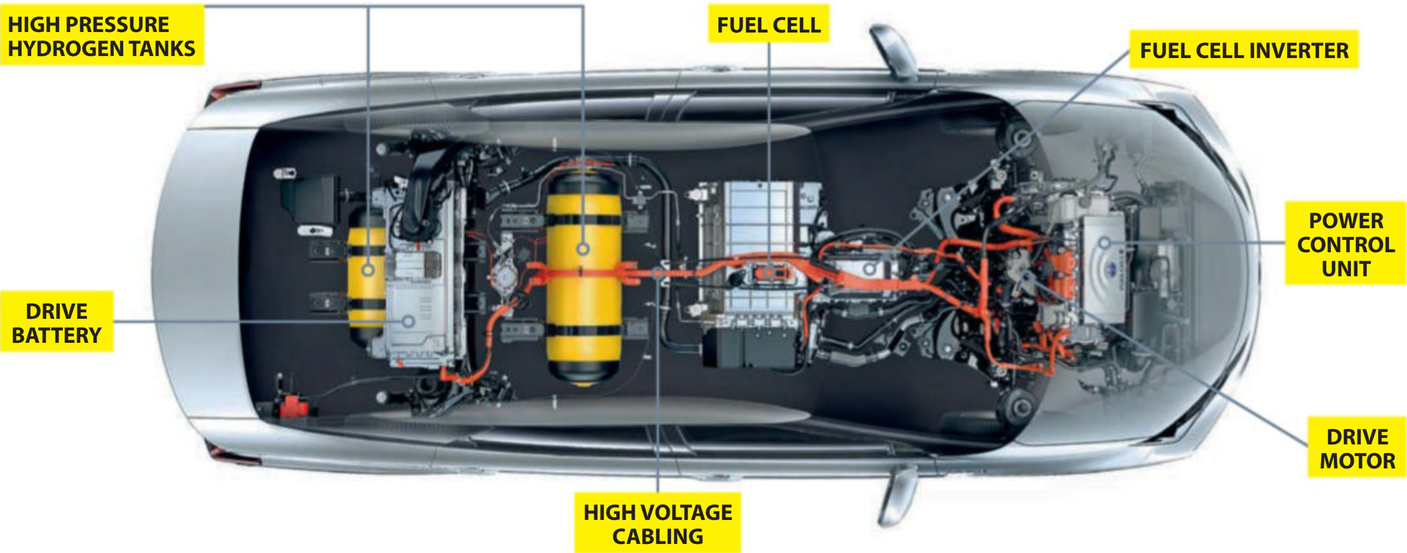


4 Hydrogen has to be stored somewhere; the 745h sacrificed the boot space. A problem with hydrogen is that its atoms are so small, that they penetrate through the tank. Therefore, the BMW suffered from a gradual reduction in tank pressure, if it was left standing, as the hydrogen molecules escaped into the atmosphere. Modern hydrogen tanks have to comply with strict regulations, as detailed in Step 30.

5 Many of these issues have since been resolved and BMW is preparing to launch its first mass production hydrogen car in 2028: the iX5 SUV. As this car is designed to be hydrogen-fuelled in the first place, the bulky tanks do not impede the interior. However, these cars will not be powered by combustion engines but fuel cells.



6 A fuel cell car converts hydrogen into electricity, which is stored in a battery. The resultant electrical energy powers the wheels. Therefore, a fuel cell car is similar to a BEV. Pictured is the iX5's mechanical layout. At the front is the fuel cell that creates 125kW of electrical energy from hydrogen. The hydrogen storage tanks are protected in the middle of the car. At the rear, a BMW eDrive electric motor features, with a high-voltage battery: total power output is 401 horsepower. The orange lines indicate high-voltage cables; the blue denote hydrogen fuel pipes.

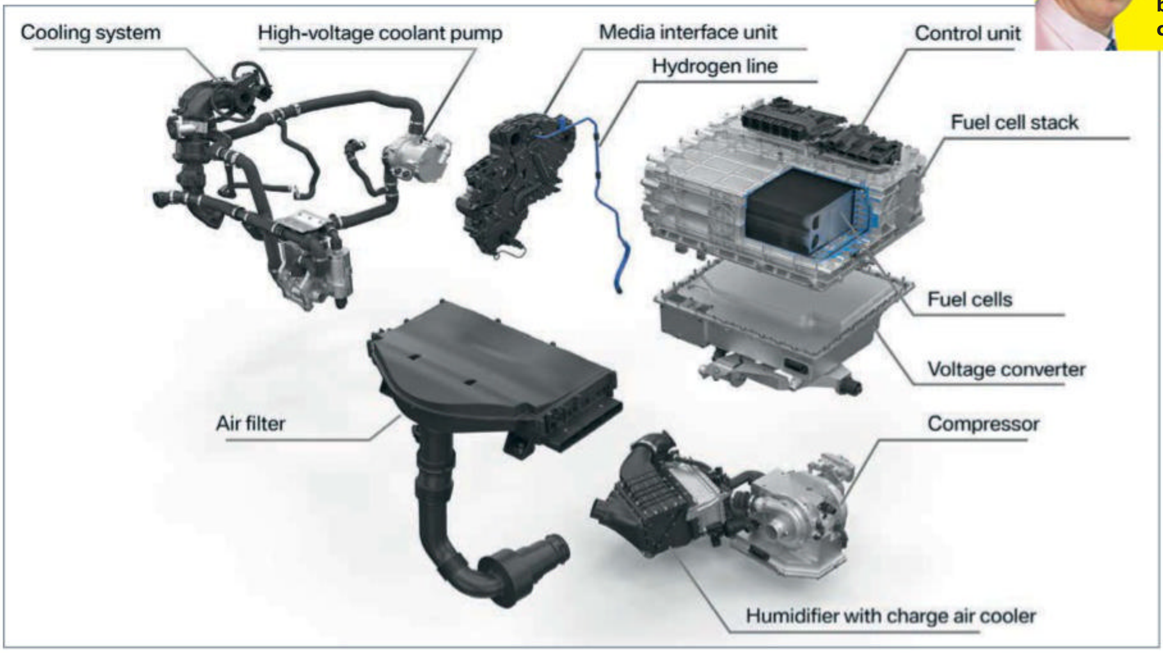


7 This layout of the previous-generation Toyota Mirai proves that mechanical layouts vary between manufacturers. As hydrogen fuel cell cars are based on BEVs, they share similar ancillary components and any DIYer should be aware of the high-voltage dangers (as detailed in the January 2025 issue). A smaller high-voltage battery is used than those employed by BEVs, because it acts as a buffer between the electrical energy generation from the fuel cell and demand from the drivetrain.

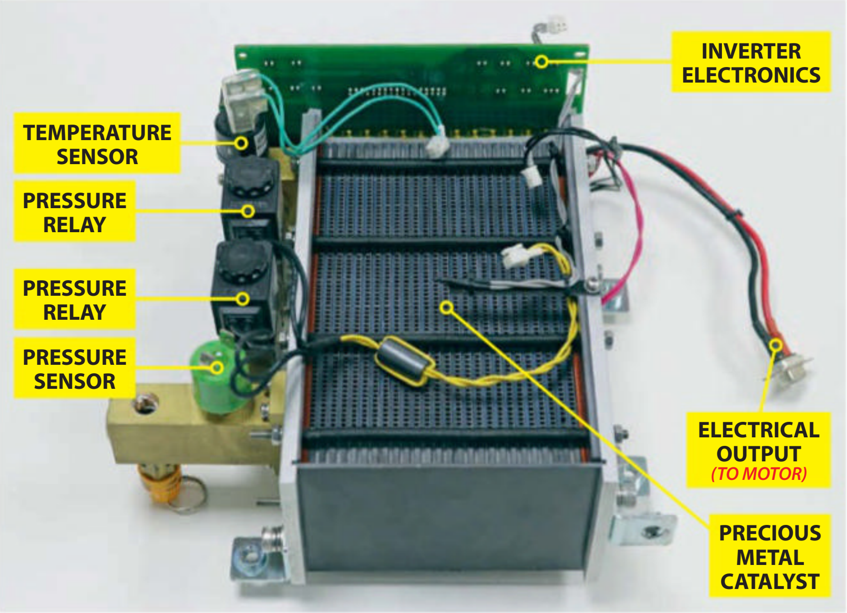
⇨

ROB'S TOP TIP

Hydrogen cars are powered by either electricity, or combustion engines.

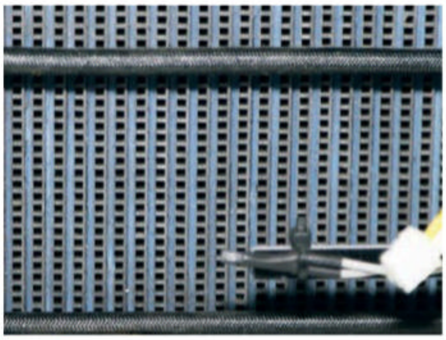

Cooling system
High-voltage coolant pump
Media interface unit
Hydrogen line
Control unit
Fuel cell stack
Fuel cells
Voltage converter
Air filter
Compressor
Humidifier with charge air cooler

8 ◀ Within the fuel cell stack, hydrogen from the tanks reacts with atmospheric oxygen to produce electricity. As efficient as the hydrogen fuel cell is, it cannot accept any other fuels, although it is possible to design fuel cells that utilise methanol, or ethanol. These fuels can also be burnt in a combustion engine, incidentally. Note the other ancillary parts that surround the stack on this BMW layout. Step 15 shows how Hyundai achieves the same goal.

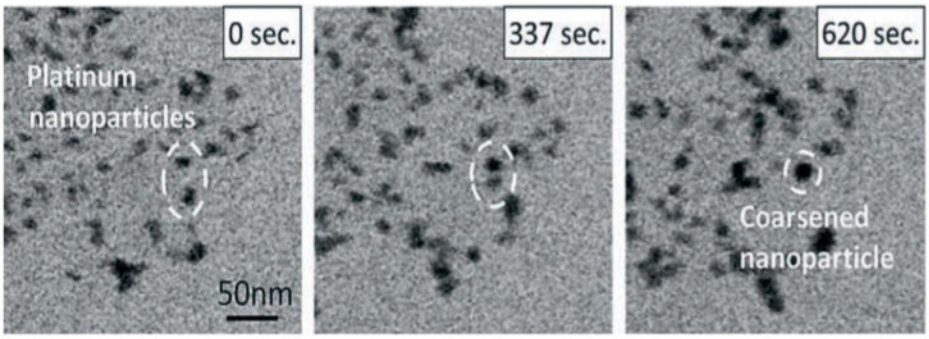

INVERTER ELECTRONICS
TEMPERATURE SENSOR
PRESSURE RELAY
PRESSURE RELAY
PRESSURE SENSOR
ELECTRICAL OUTPUT
(TO MOTOR)
PRECIOUS METAL CATALYST

9 Pictured is a fuel cell from a hydrogen generator. It may be smaller than one used in a car but it works using the same principles. It comprises a Polymer Electrolyte Membrane (PEM). Hydrogen passes through the membrane, which produces electrical energy, heat (hence the need for a cooling system on a car) and water as by-products. The electrical energy passes to a control unit/inverter and the resultant Direct Current (DC) is the power source for the vehicle.

10 A significant advantage of fuel cells is that the only emissions are water. Hydrogen combustion engine cars emit a small quantity of CO_2 from lubricating oil being burnt on the cylinder wall. Due to the high temperatures within the cylinders, they emit a small quantity of NOx emissions, too – see Step 19. This is why combustion engine hydrogen cars are not considered to be 'Zero Emission' and developments have tended to favour fuel cells for road use. Yet, fuel cells, the accompanying high-voltage batteries and motors consume precious and expensive metals.



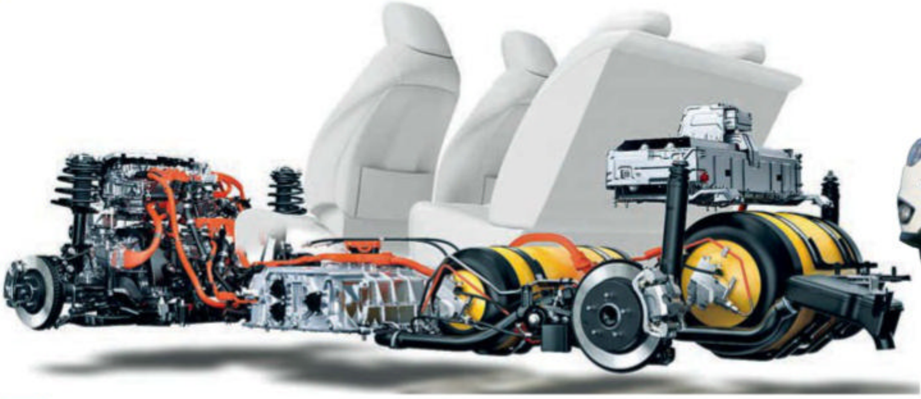
11 Like catalytic converters, fuel cell catalysts can be poisoned by low-grade fuel. Fuel cell cars require a high 'no 3' purity level hydrogen – combustion engines are not so fussy.


0 sec.
Platinum nanoparticles
50nm
337 sec.
620 sec.
Coarsened nanoparticle

12 While they are maintenance-free, fuel cells wear out, eventually. Over the last decade, Toyota found that the platinum content within the catalyst 'coarsens' as it ages. These changes occur at particle level and reduce the efficiency of the chemical reaction between hydrogen and oxygen to create electricity. Earlier this year, Toyota launched its third-generation fuel cell, stating a lifespan comparable to that of a conventional diesel engine.

Number crunching: Is a hydrogen car cheaper on fuel?

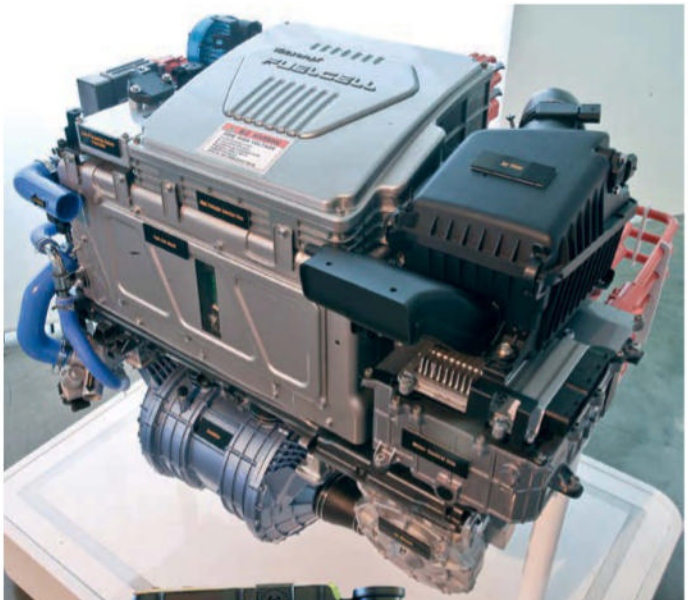
▶ Is the assertion that hydrogen is cheaper true? Taking Hyundai's Nexo as an example, Its range is 413 miles per refill of its 6.65kgs tanks. Therefore, it covers 62 miles per kilogramme. Hydrogen costs between £10 and £12 per kilogramme. Therefore, the Nexo's fuel bill will be around £73 per tank. Not only are modern combustion engines more fuel efficient on a pence per mile basis but a BEV, recharged on a well-chosen EV electricity tariff will cost under £10 to cover this mileage and, with a Tesla on the firm's supercharger network, under £40. Then, there is the problem of refuelling points. On the day of our visit to Delphi's Warwickshire training centre, there was only one hydrogen fuel filling station that was open and working in the UK – in Aberdeen.



13 The Toyota Mirai remains one of two commercially available hydrogen cars in the UK, priced from £64,695. Pictured is the mechanical layout of the previous-generation car. While it differs from the BMW iX5, the same basic parts are present: a fuel cell, hydrogen tanks, battery pack and motor.

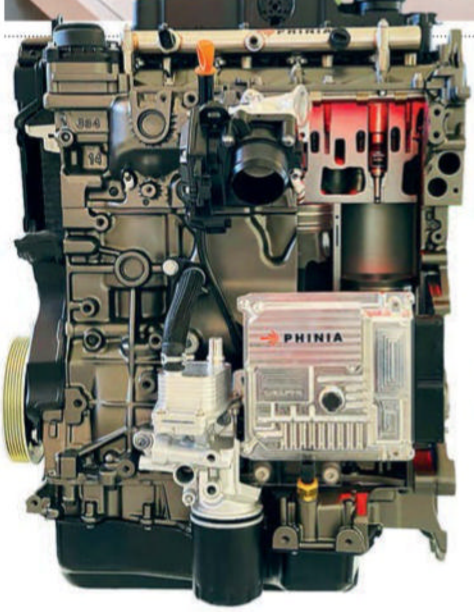
FCEV
DW 51 772

14 Like Toyota, hydrogen is not a fad for Hyundai – it established a dedicated research fuel cell team in 1998 and introduced the ix35 Fuel Cell car in 2013, declaring it as the first commercially available, mass-produced hydrogen fuel cell vehicle in the world.



15 ◀ Pictured is the ix35's fuel cell stack. The 100Kw main fuel cell is in the middle. Surrounding it are the ancillary components, which can be diagnosed, replaced and repaired separately. These include the air filter and MAF sensor to clean and monitor the incoming atmospheric oxygen, the high-voltage junction box (on the top), the fuel processing controller (on the far top left), the water cooling system (blue pipes), the humidifier (bottom centre), the air blower assembly next to it and the motor control unit (ECU) on the middle right, beneath the air filter.

16 ▶ Like Toyota, Hyundai offers a hydrogen fuel cell car to the UK market. Launched in 2018 (and poised to be replaced), the NEXO is priced from around £69,495. Its range is 413 miles, which was comparable with petrol engines at the time of its launch but not diesel. We look forward to learn how the all-new NEXO has advanced technology over its predecessor, when it appears later this year.



17 ◀ The main reason why carmakers have focussed on fuel cells is that they are classed as zero emissions by the authorities. Furthermore, using electricity to power the car is more efficient than burning it in a combustion engine. However, it is impractical for some vehicles that are in constant use to carry large and expensive batteries, such as earth-moving equipment. Fuel cells can also not provide instantaneous power without large batteries. This is why JCB and Phinia have worked together to produce hydrogen engines.

18 ▶ A hydrogen-burning combustion engine is very similar (if not identical) in architecture to a regular engine. The main differences comprise engine management, fuel rail and fuel injector specifications. Both port (indirect) and direct injection designs can run on hydrogen fuel.

19 To control NOx emissions, modern combustion engines employ both exhaust gas recirculation and Selective Catalytic Reduction (which requires AdBlue as per Euro 6 diesel cars) to reduce the NOx. This engine is a 1.2-litre PSA/Stellantis PureTech petrol engine (yes, the one with the wet belt!) that Phinia has converted to run on hydrogen. The firm has also adapted several diesel vans to run on H_2. However, Cummings' engine is a bespoke hydrogen unit.

ROB'S TOP TIP

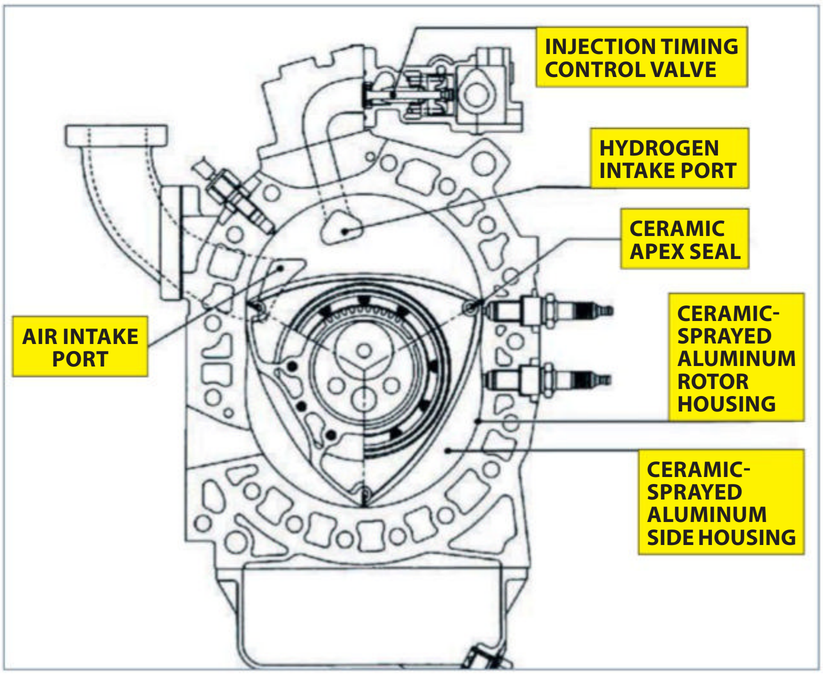
Some countries have superior hydrogen refuelling networks, so hydrogen cars are more popular than here.

HYDROGEN RE
BD160

20 Mazda has experimented with hydrogen combustion since the early 1990s. After finding that very few modifications were needed to its mass production Renesis rotary engine, the Japanese firm introduced its RX-8 Hydrogen RE in 2008, which was a very limited-production run, adapted specially to run on hydrogen. Mazda also wanted to develop combustion engine technology, because it believed that most cars by 2020 would still use them – a prediction that proved correct.

21 At the time, Mazda highlighted that fuel cells could not accommodate dual-fuel technology. The RX-8 Hydrogen RE, therefore, had two 105-litre capacity hydrogen tanks in the rear (obliterating any useful boot space, just as with the BMW 745h) and a single 5-litre petrol fuel tank beneath the passenger seat.

22 ▶ The way Mazda got around the leakage problem was to store hydrogen as a gas at a relatively low pressure. Unfortunately, only 60 miles could be covered by 350 BAR of hydrogen from its 105-litre tanks, compared with around 27 miles from five litres of liquid petrol. The hydrogen car also had revised rear springs and dampers to cope with the increased weight. The image shows how the Renesis hydogen engine differed from the petrol unit.


INJECTION TIMING CONTROL VALVE
HYDROGEN INTAKE PORT
CERAMIC APEX SEAL
AIR INTAKE PORT
CERAMIC-SPRAYED ALUMINUM ROTOR HOUSING
CERAMIC-SPRAYED ALUMINUM SIDE HOUSING

23 Mazda highlighted that a reason for the low range is that hydrogen develops less energy per volume than petrol and, therefore, more hydrogen is needed. Mazda's engineers stated that, at the time, locating a hydrogen injector within the inlet chamber was easier on a Wankel than a narrow cylinder-head of a piston engine. Conventional petrol injectors were fitted to the inlet manifold. EGR was fitted to help reduce NOx emissions – SCR technology was in its infancy at the time.

F
E
H₂
F
E
0
1
2
3
4
5
6
7
TRIP 0.7
0
km/h
x1000r/min

24 I drove the Mazda RX-8 Hydrogen RE in Oslo in 2008 and found its performance disappointing, when running on hydrogen, validating Mazda's assertion about the downsides of running an engine on hydrogen in gaseous form. The figures bear it out. The standard 1300cc RX-8 petrol car produced 230 horsepower but Mazda's engineers had to tune the H_2 Renesis more for torque, resulting in a power drop to 109 horsepower and a reduction in maximum revs from 8000 to 6500rpm.

Hydrogen road fuel – a green highway, or dead end?

The environmental credence of hydrogen comes under greater scrutiny, when the electricity used in its production is analysed.

Green hydrogen is ideal, because the electrolysis process is powered by electric energy that is generated from renewable sources. Grey hydrogen is made from Steam Methane Reforming, the relative inefficiency of which is proven by around 7kgs of CO_2 being produced per 1kg of H_2. No carbon capture technology is employed. Blue hydrogen is the same as Grey hydrogen but with CO_2 capture. Black hydrogen uses electricity produced from coal, which is highly CO_2 intensive.

2019 figures show that almost half of the UK's hydrogen production employed fossil fuels. Steam Methane Reforming (either grey or blue hydrogen) accounted for a similar percentage, with green hydrogen accounting for just 4%. This figure reduces to 1% globally. Therefore, it is not hard to see why hydrogen is not viewed as a particularly sustainable and efficient fuel source – at least for now.

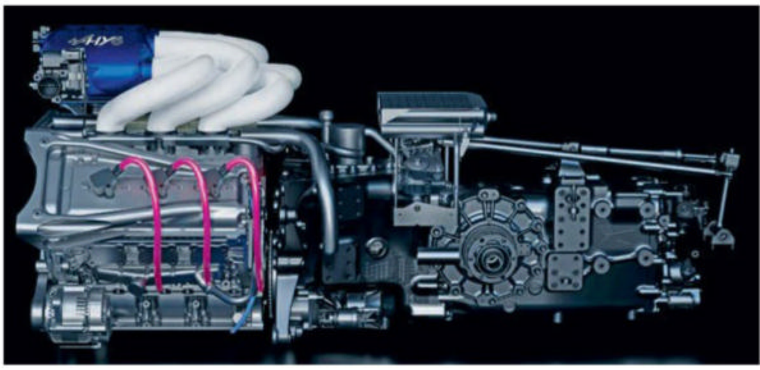
Yet, technology continues to evolve. Gold hydrogen, for instance, involves fermenting microbes in depleted oil wells. Yellow hydrogen is also seen in a positive light (pun intended) because it is produced from solar energy. Turquoise hydrogen does not produce any CO_2; it splits methane from natural gas, resulting in hydrogen and Carbon Black. Pink, red, or purple hydrogen uses nuclear power. It is also realised that hydrogen occurs naturally in underground deposits and some reports indicate this could power human activities for 1000 years. Yet, as of now, no technology exists to extract it.

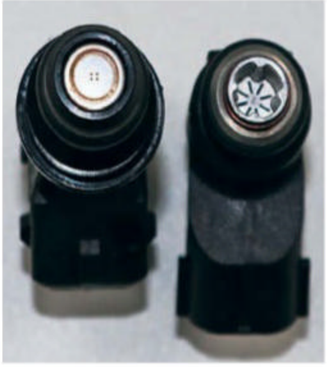
25 **Despite these technical challenges, car companies have continued to develop hydrogen combustion engines. Toyota has competed hydrogen-powered Yaris GRs in the Japanese Super Taikyi race series. Like Mazda did almost 15 years beforehand, Toyota has adapted the fuel supply and injection system on its existing production 1.6-litre three-cylinder Gasoline Direct Injection (GDI) production engine to accept hydrogen fuel. The firm reports that, because hydrogen burns at a faster rate than petrol, the engine remains responsive, while delivering very low tailpipe emissions. Toyota admits that a combustion engine delivers a more fun-to-drive experience, acknowledging acoustic and sensory sensations are missing from conventional fuel cell vehicles.**

$2H_2+O_2=2H_2O$+ENERGY

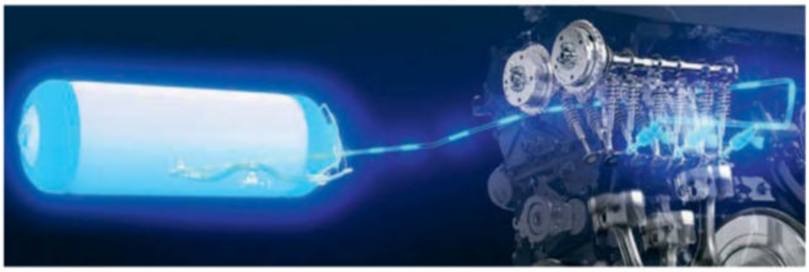
26 **Phinia also has brought glamour to the hydrogen engine, by developing and supplying the hydrogen components for the Renault Group's Alpine Alpenglow, a clean-emissions racing machine. As with all hydrogen vehicles, water is the primary waste product.**

27 **The Alpenglow's hydrogen-powered 3.5-litre, twin-turbocharged V6 engine produces 740bhp and uses water injection to reduce NOx emissions. Alpine says that combustion advantages over a fuel cell racer include higher power outputs, excellent efficiency under heavy loads, and reduced cooling requirements, because a large proportion of the heat dissipates through the exhaust system.**





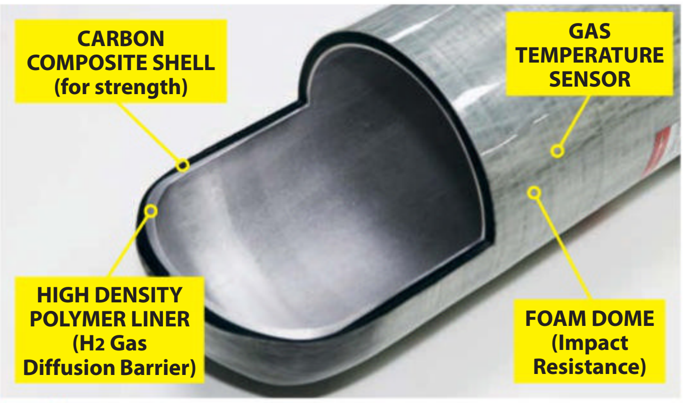
28 **As highlighted earlier, Phinia's technical prowess extends to adapting existing production modern petrol (spark ignition) and diesel (compression ignition, albeit a spark plug is inserted instead of a glow plug) engines. Pictured is a conventional fuel injector for a petrol engine (left), versus a hydrogen injector (right) for the same engine – note the larger nozzles needed, because more hydrogen gas is required to generate the same power, compared with petrol vapour. Naturally, a new engine management system has to be developed, too.**



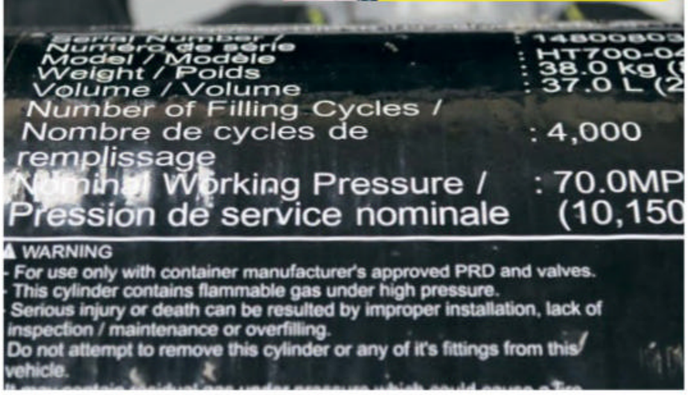
29 **The means of increasing mileage between refuels rest not necessarily with the engine but fuel storage development. As both Mazda and BMW discovered, keeping gaseous hydrogen stored at a relatively low pressure reduces the chance of its tiny molecules escaping but the disadvantage is low range. However, hydrogen's relatively low energy density can be increased without raising the pressure if its temperature is reduced. This is why manufacturers are investigating cryo-compressed hydrogen, where the hydrogen is stored between 10 and 350 BAR but its temperature is reduced to between -200 to -240 degrees Celsius. Liquid hydrogen is cooled to under -260 degrees Celsius but stored at relatively low pressures of between 1 to 10 BAR.**

ROB'S TOP TIP

Hydrogen cars drive similarly to combustion, or battery electric vehicles.


CARBON COMPOSITE SHELL (for strength)
GAS TEMPERATURE SENSOR
HIGH DENSITY POLYMER LINER (H2 Gas Diffusion Barrier)
FOAM DOME (Impact Resistance)

30 Current production cars are equipped to handle gaseous hydrogen. These modern Type IV pressure vessels store hydrogen at pressures at least ten times higher than that of Mazda's RX-8 Hydrogen RE (at either 3500 BAR or 7000 BAR). Yet, developments in storage tank technology reduce the chance of leaks significantly. They are made from layers of woven carbon fibre-reinforced plastic, made to the most stringent regulations.

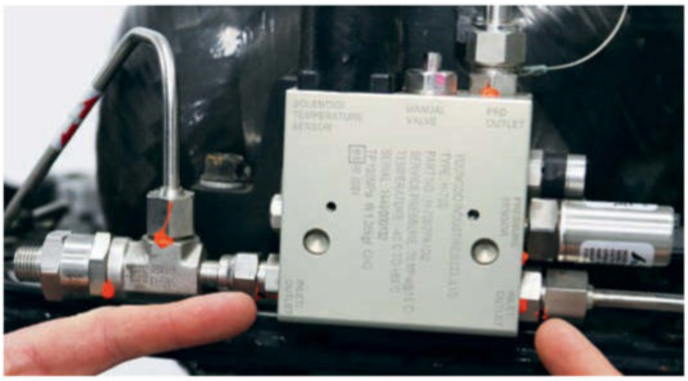


Serial Number / Numéro de série : 14800803
Model / Modèle : HT700-04
Weight / Poids : 38.0 kg (
Volume / Volume : 37.0 L (2
Number of Filling Cycles / Nombre de cycles de remplissage : 4,000
Nominal Working Pressure / Pression de service nominale : 70.0MP (10,150

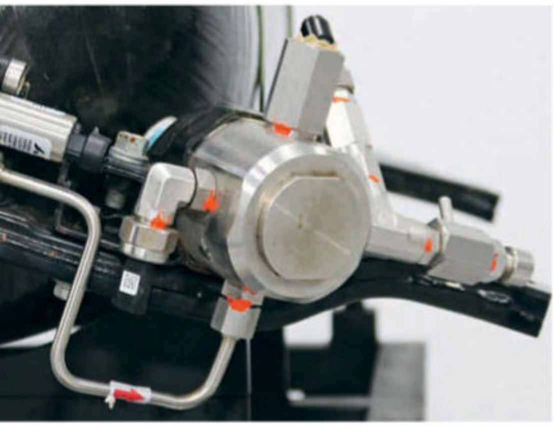
⚠ WARNING
For use only with container manufacturer's approved PRD and valves.
This cylinder contains flammable gas under high pressure.
Serious injury or death can be resulted by improper installation, lack of inspection / maintenance or overfilling.
Do not attempt to remove this cylinder or any of it's fittings from this vehicle.

31 These tanks expand slightly when refuelled, and contract, as the fuel pressure falls in use. This is one reason why the tanks do not last indefinitely. Toyota (Step B7) expresses its replacement intervals in years and filling cycles; Hyundai (pictured) expresses filling cycles alone.

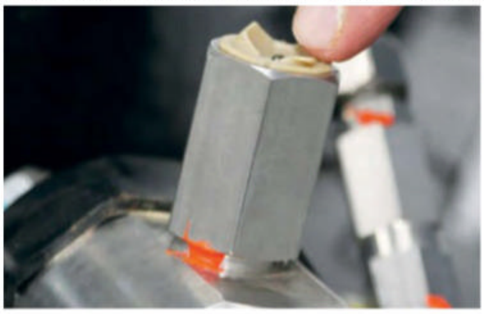
32 Phinia's training centre in Warwickshire offers an IMI Level 1 practical course in hydrogen for professional technicians and a more in-depth single-day hydrogen training course, covering both combustion engines and fuel cells. This hydrogen fuel tank test rig comprises Hyundai parts, mounted to a chassis that makes it easier to see the relevant components.



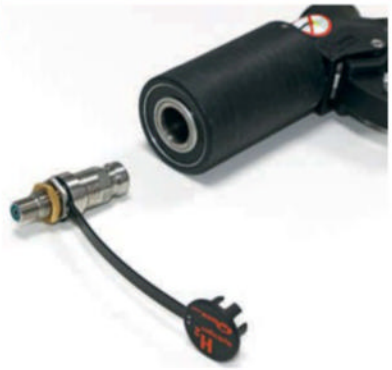
33 Regardless of whether a hydrogen car utilises a fuel cell, or a combustion engine, regulators step down the hydrogen pressure from the tank to that needed by the fuel system. A combined solenoid and sensor unit is fixed to each of the two hydrogen tanks on this Hyundai set-up. Each one comprises an inlet, an outlet and sensors for both temperature and pressure. A manually-operated valve is also fitted, which is used for purging (see Steps C1 to C10).



34 ◀ Adjacent to the combined solenoid/ sensor assembly is the Hydrogen Regulator Module. Essentially, this is a pressure regulator that adjusts the hydrogen pressure from the tanks to a pressure suitable for the fuel injection system.



35 ◀ On top of the Hydrogen Regulator Module is the union that feeds hydrogen to the fuel lines. On fuel cell cars, the pressure varies between 5-20psi; combustion engines require 15-100psi.



36 The hydrogen refuelling process is similar to that of conventional liquid fuels, except that the filler locks onto the car. Another difference is that the car informs the dispenser about the pressure levels within the tank, using an inferred beam and sensor. Pictured right is the transmitter on the car and the receiver within the fuel nozzle.

When Hydrogen becomes the invisible enemy

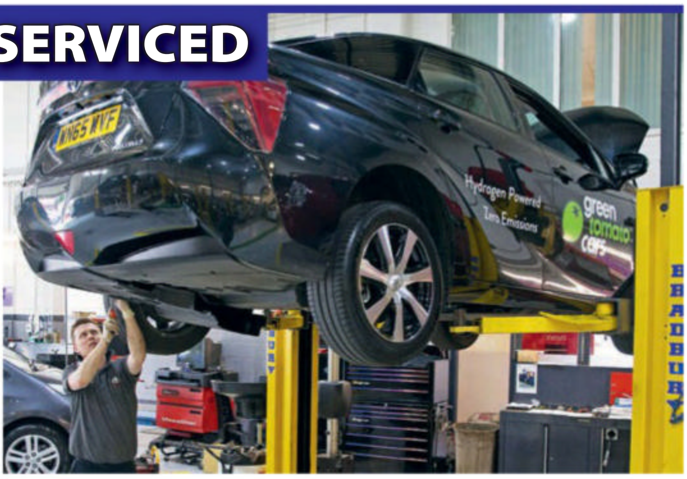
While invisible, colourless and odourless, Hydrogen is also extremely easy to ignite, when exposed to over 4% oxygen (typical atmospheric air contains 21%). Therefore, just because you cannot see or smell anything, you cannot rely on your senses to confirm that no danger is present. When released into the atmosphere, hydrogen rises very quickly, risking it collecting in confined spaces, resulting in a very flammable gas pocket.

A further problem is that burning hydrogen produces a barely visible pale blue flame. Its combustion also radiates very little heat and so you do not know about a hydrogen fire, unless you are virtually within it.

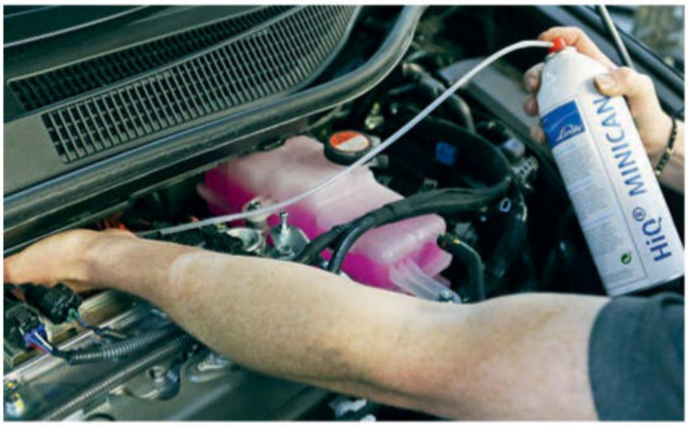
This explains why Phinia's hydrogen training focusses mainly on leak detection methods and emphasises the importance of preventing hydrogen from collecting and being ignited accidentally.

HOW A HYDROGEN CAR IS SERVICED

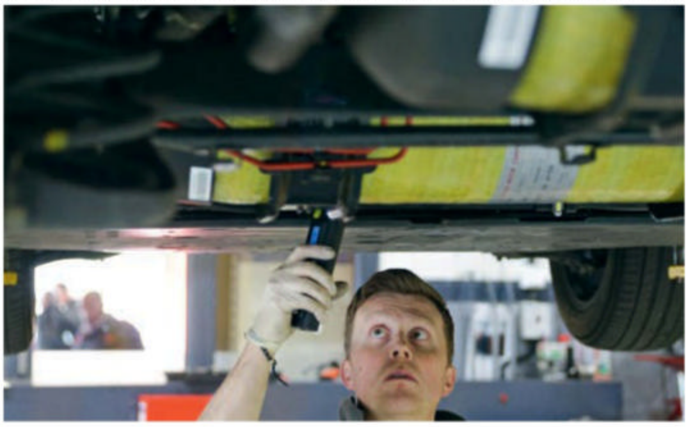
B1 Like a BEV, a hydrogen car is still a car. This means that conventional items, including braking, suspension, body and various electrical systems, require periodic inspections, just like hydrogen's petrol and diesel brethren. The following overview looks at the extra items that a hydrogen car requires with specific reference to the first-generation Toyota Mirai.



B2 As hydrogen presents an extreme danger risk, should any be released, there are specific requirements for service bays. Any light switches/electrical sockets must not create internal sparking, for instance. Even the presence of mobile 'phones in the working area should be considered. Hydrogen service bays, looking similar to car washes, are available to buy, which possess hydrogen sensors and extraction fans.



B3 This Mirai also has a hydrogen sensor, which detects the presence of any hydrogen leaks. It is a requirement that this is tested at every service. This procedure is performed with an aerosol spray containing a weak hydrogen mix.



B4 A further problem with hydrogen generally is embrittlement, which is when hydrogen atoms penetrate a metal material, causing it to crack. This is why a thorough inspection of the whole fuel line must be completed.

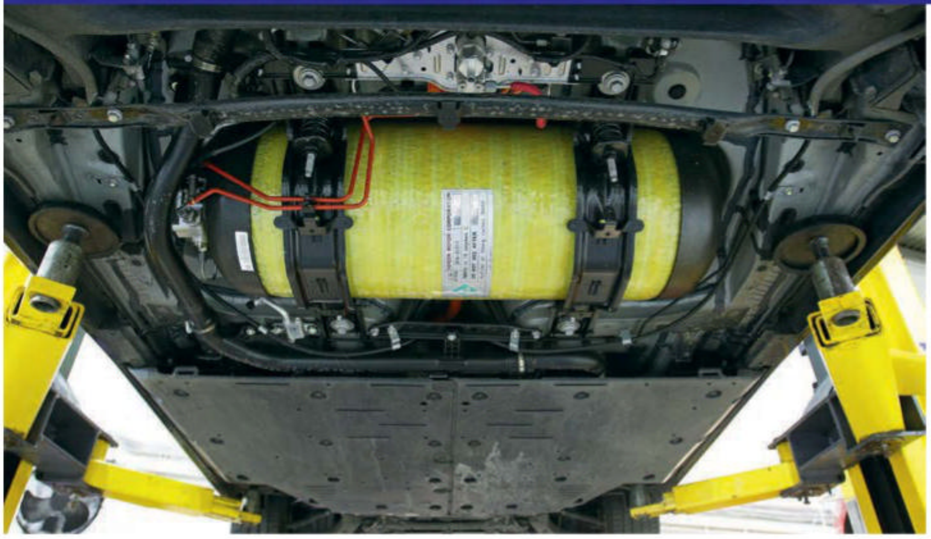
B5 A further vital operation is to test for hydrogen leaks. As H_2 is odourless, this is performed with a hydrogen 'sniffer' probe. This image is not of a Mirai fuel cell but of a combustion engine.

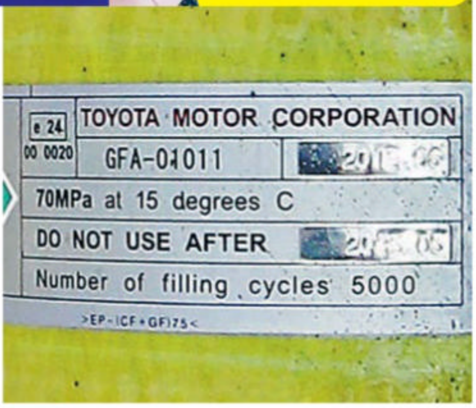
B6 As the fuel cell generates heat, it needs a dedicated cooling system. Again, the level and specific gravity of the coolant are checked at every service. On this age of Mirai, inspection intervals are relatively short: 5000 miles, or six months, whichever the sooner.

ROB'S TOP TIP

Generally, hydrogen engines have the same servicing requirements as those of petrol/diesel.

HOW A HYDROGEN CAR IS SERVICED CONTINUED





B7 As they possess finite lifespans, the hydrogen tanks are checked not only for condition and the security of their mountings but also that their use-by date has not expired. This is marked clearly on each tank, as per Step 31.

PURGING THE FUEL SYSTEM

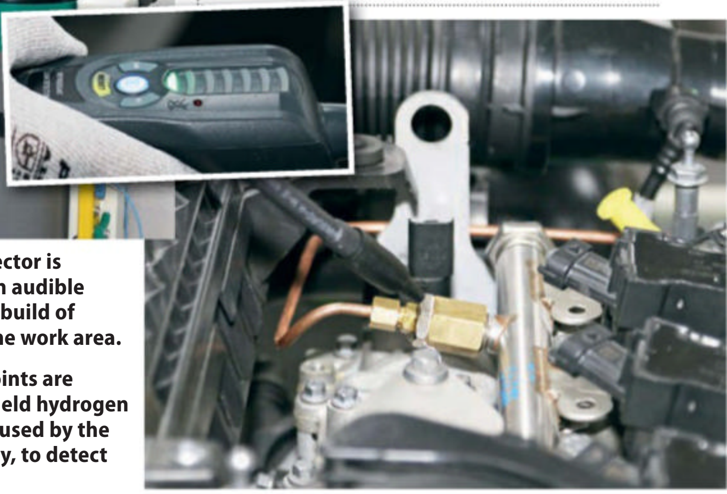
Should any part of the hydrogen fuel system require disconnecting, such as when replacing a fuel rail, sensor, or fuel injector, the system must be purged of hydrogen and flushed with non-reactive nitrogen. This is necessary, because you need to prevent any risk of hydrogen leaking and collecting in a pocket anywhere within your work area.

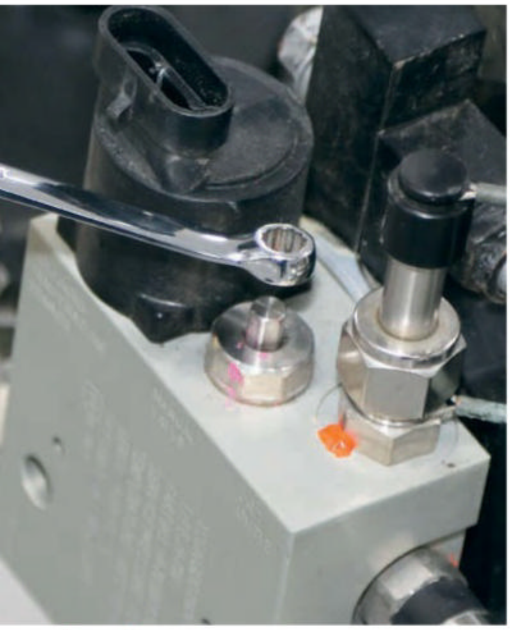
C1 As with any car repair, safety must be the priority. The location, selected to work on hydrogen cars, must allow rapid dispersal of any escaped gas (see Step B2). In this example, the system shall be purged as if a combustion engine's fuel injection rail needed replacing.

C2 Even the risk of static electricity creating a spark that could ignite hydrogen is very real. For this reason, PPE includes not only a full-body suit and gloves but also anti-static floor mats.

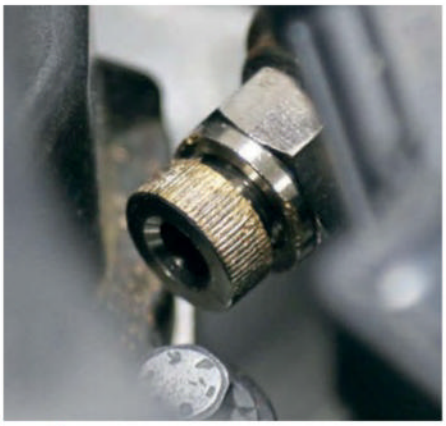
C3 ◀ A hydrogen gas detector is also worn that issues an audible warning, should any excessive build of hydrogen gas be detected in the work area.

C4 ▶ Leaking hydrogen joints are detected with a hand-held hydrogen 'sniffer' probe. These tools are used by the air-conditioning repair industry, to detect leaking refrigerant systems.

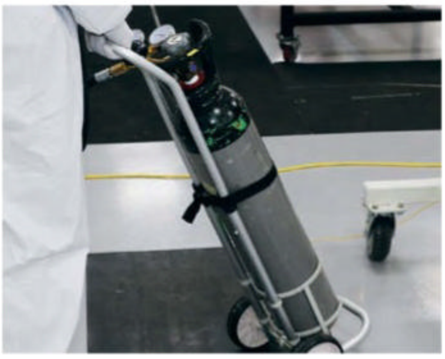




C5 The first stage is to close the manual cut-off on the hydrogen fuel tank (see Step 33) to isolate the hydrogen tanks from the rest of the fuel system.



C6 Unscrewing this bleed screw from the fuel injector rail will evacuate the pressure and release a limited quantity of pressurised hydrogen into the work area. However, hydrogen under atmospheric pressure will remain in the fuel lines, which must be evacuated.



C7 ▶ This task is performed, by pumping an inert gas (i.e. one that is neither flammable, nor reacts with anything) through the fuel lines. In this case, nitrogen is used.

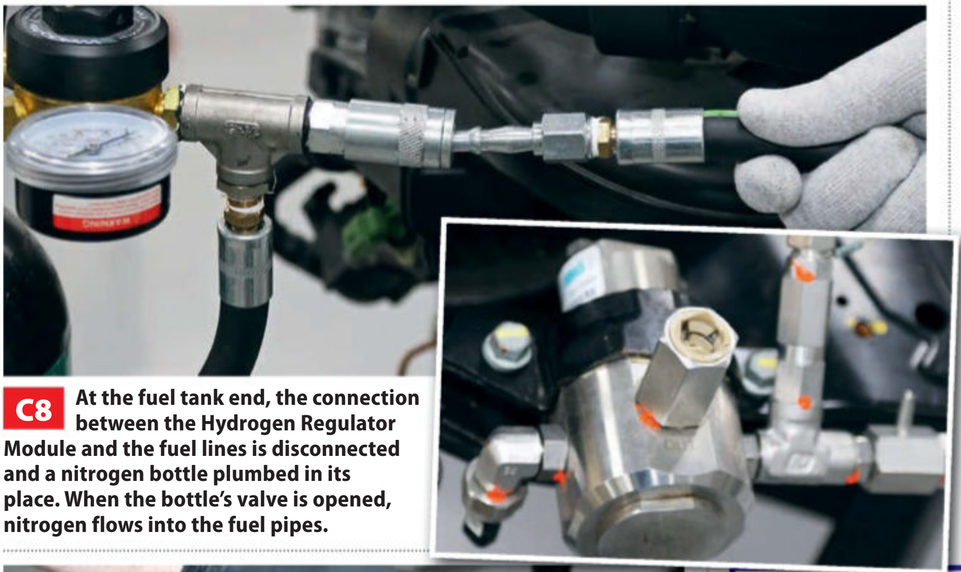
THANKS TO

PHINIA™

We are grateful for the advice from the team behind **PHINIA** and **Delphi's** new Academy, which is hosting a variety of courses that are aimed mainly at professional technicians.

For more information on Delphi's Academy, see: **www.delphiautoparts.com/en-gb/workshop-solutions/delphi-academy**

Course can be booked online, via: **booking.delphiautoparts.com**



C8 At the fuel tank end, the connection between the Hydrogen Regulator Module and the fuel lines is disconnected and a nitrogen bottle plumbed in its place. When the bottle's valve is opened, nitrogen flows into the fuel pipes.

C9 The excess hydrogen is then forced through the fuel rail bleed screw. The technician uses the sniffer probe, to detect that all hydrogen has been dispersed, before closing the nitrogen tank valve.

C10 The fuel rail can be unbolted in the conventional manner. Upon reassembly, there tends to be no need to bleed the system through with hydrogen, as it self-primes.

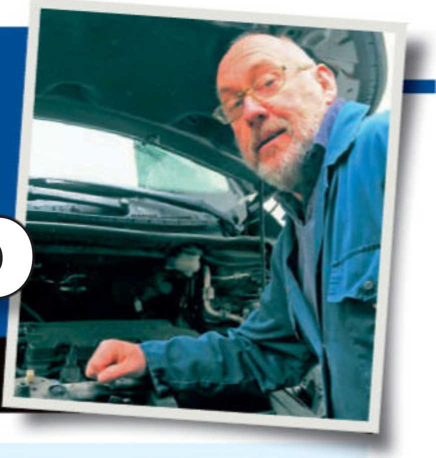
Conclusion

▶ So, hydrogen: it is not particularly green, it is expensive, has a relatively low energy density, is complicated to store, is not especially efficient and struggles to trounce conventional combustion cars on range. Yet, this is how things stand today. Technology is changing all of the time and liquid fuels could rise back into prominence, should our electric grid struggle with increasing numbers of BEVs.

Should hydrogen be produced from more renewable sources and carmakers discover ways of having cars carry cooled nitrogen, many of the current challenges could be resolved. Above all, fuel cells provide electric car enthusiasts another means of enjoying their motor-powered cars, while hydrogen could prove to be the saviour for internal combustion. Remember that internal combustion hydrogen is establishing itself as a key technology for highway and off-road applications. Yet, for motorcars, hydrogen may still be a fuel for the future, it just will take a little longer to get there.

Tales from the workshop

Fixing advice from our garage proprietor **Steve Rothwell**



SMART FORFOUR

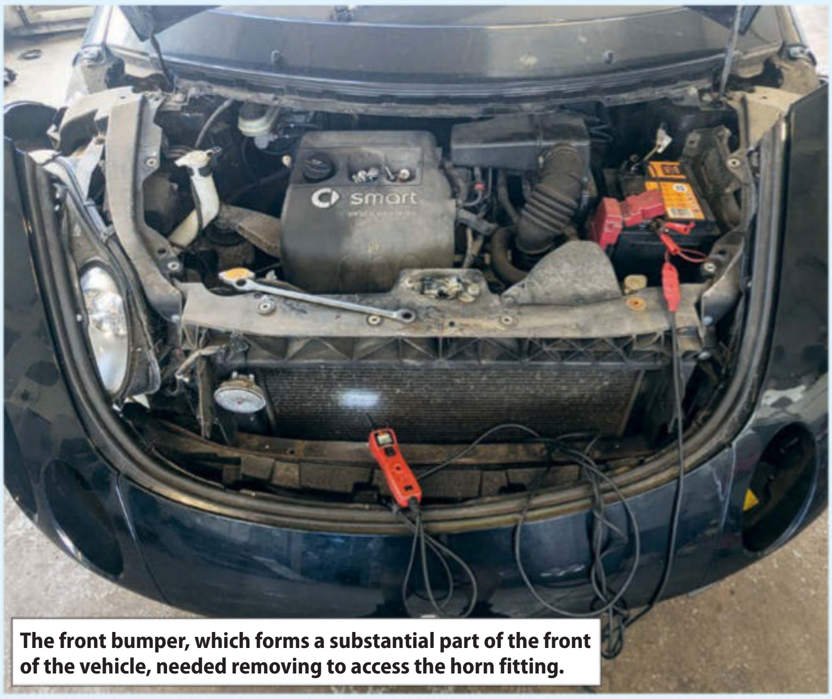
Horn access

The horn on this little 2006 smart forfour did work, but barely. The sound was definitely more of a squeak than a parp. It was, in fact, so timid and embarrassing to use that the owner decided that it did need to be replaced with something a little stronger.

The job of swapping the old poorly operating horn for the new louder version, is simple, but the access to get to the horn involves removing the front bumper, which is basically the front of the vehicle. The bumper wraps around the sides and is affixed at the rear of the front wings.

The front is quite easily removed, but it does seem a lot of effort to simply unbolt the single fixing securing the horn, to replace the unit.

Once the new horn was in place and had been tested to ensure it did give a good strong sound, the front bumper assembly was refitted and the little smart forfour was ready for the road.



The front bumper, which forms a substantial part of the front of the vehicle, needed removing to access the horn fitting.

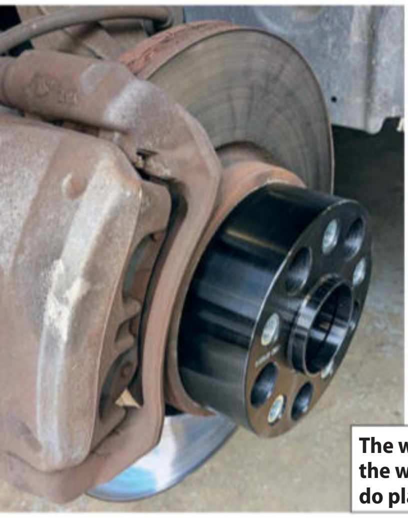
VOLKSWAGEN AMAROK

Wide wheels

The owner of this 2018 Volkswagen Amarok V6 double cab pick-up was quite pleased with his motor but had recently seen one online with what appeared to have a wider wheelbase. After looking into this, he discovered that the one he had seen was fitted with wheel spacers, so he decided that this would be a good option for his VW.

Personally, I worry about the extra load on the bearings which is applied when the wheel spacers offset the wheels, but after voicing my concerns the customer was adamant, and we all know that the customer is always right.

With the new spacers fitted, the Amarok had the wider wheelbase that the customer desired and did look quite the beast. Hopefully it will continue to perform as intended and I will not see the motor back within the year for a set of hub bearings.



The wheel spacers are easy to fit and give the wider wheelbase desired, but they do place a strain on the hub bearings.

CITROËN C4 GRAND PICASSO

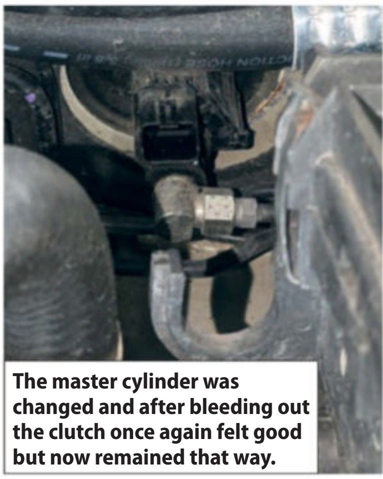
Soggy clutch

Very often a poor feel to the clutch pedal will be a result of a worn clutch plate or cover, and in most cases the hydraulic operating system of the clutch will give years of uninterrupted service. There are of course the exceptions and so the hydraulic operation is always worth checking when a problem feel to the pedal is reported.

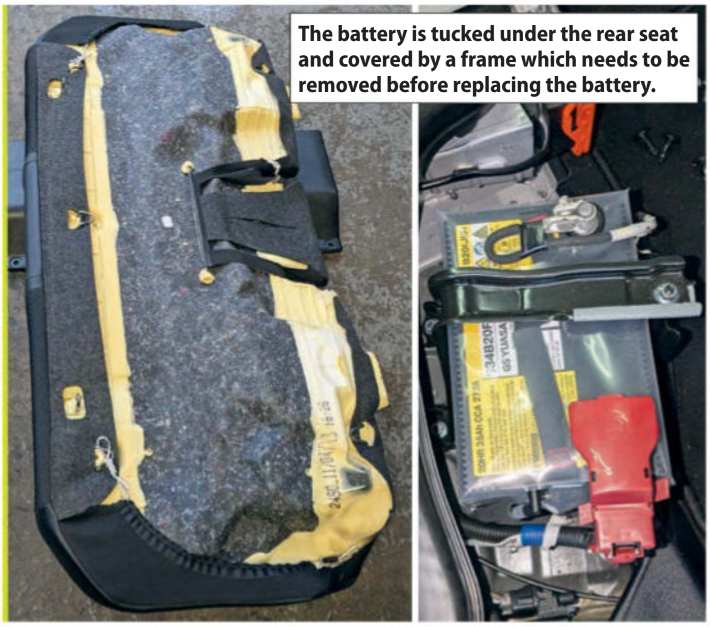
The 2017 Citroën C4 Grand Picasso 1.2 PureTech petrol came in with the owner reporting a poor feel to the clutch pedal – and with a 7.9-hour book time on the clutch replacement, I am sure the owner was hoping that this was not going to be the source of the problem. With less than 50,000 miles on the clock, this would also not be a welcome diagnosis.

The clutch was first bled out to see if this improved things, and for a short time it did. This was though only a very short-lived improvement which did at least confirm the fault was hydraulic and not mechanical.

The master cylinder did turn out to be the source of the problem and as this had a replacement book time of only 1.1 hours, it was a better and less costly outcome for the owner.



The master cylinder was changed and after bleeding out the clutch once again felt good but now remained that way.



The battery is tucked under the rear seat and covered by a frame which needs to be removed before replacing the battery.

TOYOTA YARIS

Hidden battery under rear seat

At over ten-years-old, the battery in this 2013 Toyota Yaris Hybrid was doing well. It had only let the owner down once in the past six years ownership, and that was due to the interior light being left on.

It was now though struggling to start the little 1.5 engine after an overnight stand, and so the 12V battery was in need of renewing. The battery jump points are easy to access under the bonnet, but the 12-volt battery itself is located within the vehicle and hidden behind the seat close to the hybrid battery.

To access and replace the battery, the rear seat needs to be removed along with a protection cage. The battery is also fitted with the smaller terminals that appear to signal that the battery should be more expensive. Due to the restrictions in the fitment area, this does need the correct battery to be fitted. Although if the replacement lasts as long as the original, I am sure the owner will not complain.

With the new battery in place, the charging was checked before replacing the cage and rear seat base.

BMW 3-SERIES

Water leak from rear

Concerned if his 2009 BMW 330d was safe to drive, the owner explained to me over the phone how there was a serious water leak that had left a large puddle. My first question was "where is the puddle forming"? I should have been more specific because he answered, "on the floor"!

When he realised that I meant whereabouts under the BMW was the puddle, he told me that this was in the area of the nearside rear. Armed with this information, and after asking him to dip his finger in the puddle to ensure it was not at all oily and was just water, I was confident that the 330d could be driven along to me without any mechanical concerns.

When the BMW arrived, the owner was still quite unsure and was not happy driving with this drip from the rear. I was soon able to convince him that this would not affect the driving, but it did need attending too.

Opening the boot and lifting up the rear cover, I was able to show him that a leak at some point had allowed the rainwater to gather in a rear compartment and this was now leaking out. This was the source of the water he could see dripping.

The water the owner could see leaking from below was the result of a leak into the vehicle gathering in the rear boot area.

HONDA CIVIC

Braking worries

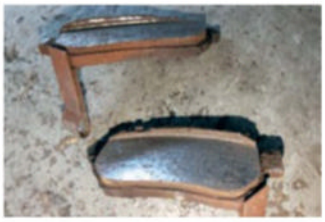
Sadly, some of the jobs that I come across are needed prematurely due to the fitting of inadequate or poorly manufactured parts. Sometimes this is just a poor or incorrect fitment where the parts looked about right and so were just fitted.

This 2000 Honda Civic 1.6 petrol had come in with a terrible brake squeal. The brakes appeared to work OK, but the owner was unhappy that the motor sounded like a lorry every time he was slowing down. At the lightest application of the brake, a squeal was emitted that set his teeth on edge.

The brakes had not been looked at in the nine months he had owned the Honda, and the problem was slowly getting worse, and so he thought it would be a good time to discover the source of the noise and get the problem fixed.

Removing the wheels and taking the caliper out of the carrier I could see the source of the problem. The brake pads fitted were the incorrect size and they were actually larger than the disc that they were meant to make contact with. This resulted in the top edge of the brake pad from having no disc contact, and allowing it to ride over the edge of the disc.

This set up the vibration that was causing the nasty and unwanted squeal. The brake discs were still in a good condition and all that was needed to remedy the problem was a new set of the correctly fitting brake pads.



The brake pads were incorrectly sized and were lapping over the edge of the disc – as they wore the squealing sound became progressively worse.

FORD FIESTA

Bashed mirror

▶ This job started with a panic phone call from one of my regulars – someone has hit my Fiesta overnight and broken the mirror, the bits are spread across the floor. Can you get me a new mirror?

My first reaction was to ask if the bits on the floor looked to be broken or simply knocked off, and what was the damage to the mirror? With mirrors now being painted and colour-coded to the vehicle, replacing the unit does now involve the spraying of either the complete mirror or as in this case the rear panel. I was then sent a picture of the bits laying on the floor.

At this stage I told my customer to pick up the pieces and pop along to see me. It is sometimes the case that a good hit to the mirror will knock the assembled sections off but not cause any serious damage.

Unbelievable in this case that was exactly the situation. Even the mirror glass was in one piece, and the mirror outer trim, glass and back panel could all be reassembled, which I completed while my customer was watching, much to their delight.

I also said those words that every customer likes – "no charge"!

The owner sent me a picture of the pieces thinking that a new mirror was needed, thankfully all the parts fitted together again.

NISSAN QASHQAI

EGR problem

▶ One of the checks that I often advise when there are running or starting problems is the EGR valve – a sticking EGR valve can give symptoms that are not always apparently connected to the valve. This 2013 Nissan Qashqai 1.6 dCi did not fall into that category and the with the engine management light on and the code P0401, an insufficient flow through the exhaust gas recirculating valve was the first point to check.

Once the valve and the pipe were removed, the blockade was soon confirmed and the next stage was to clean-out the accumulated carbon deposits from both the valve and the pipe.

After a short clean the EGR valve and the pipe were refitted and the fault code cleared. The Nissan was then given a run to ensure that it was operating as it should.

The test drive went well, and the Qashqai returned to its owner who informed me that they had only owned the Nissan for a short while and it had been used for several short runs prior to them purchasing it.

This, I suspect, was the reason for the build-up of carbon and hopefully with the new owners now using the Nissan for some longer runs, the problem will not reoccur.

The EGR valve and the pipe were blocked with carbon, and once this was cleaned-out, the codes could be cleared and hopefully will not return.

SUBARU FORESTER

Shot lower swivel

▶ The MOT failure list on this 2004 Subaru Forester 2.5 Turbo looked quite long at the first glance, but when looked at a little closer it was seen that most of the problems were quite minor. A couple of bulbs and a couple of balljoint dust covers, along with a slightly blowing exhaust and a couple of other very minor and quickly fixed problems.

It turned out that the one job that needed serious attention was the lower swivel joint on the offside front of the vehicle.

The balljoint on this one is fitted into the hub and secured with a pinch bolt, and the lower taper on the balljoint fits through the lower arm.

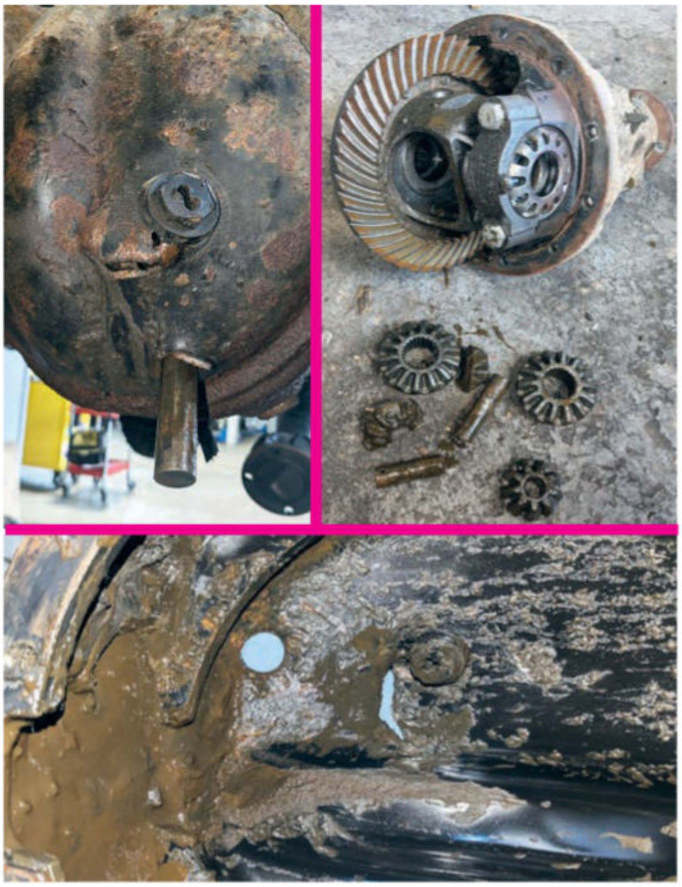
The good news is that the balljoint is relatively cheap – the bad news is that it can be difficult to disconnect from the hub and the lower arm. A good soaking with a penetrating oil first certainly helped in the dismantling of this one, and once the old swivel was out, fitting the new swivel was a simple task.

With the rest of the MOT failure list covered, the pass could be issued.

The swivel needed to be removed from the hub flange and the new one fitted in place.

LAND ROVER DISCOVERY

Diff disaster



This 2001 Land Rover Discovery TD5 2.5 diesel was certainly a working vehicle and used to haul the owner's mini digger around on a trailer. The trailer was quite rattly when being towed, and the owner switched off his sense of hearing and upped the radio when going from point-to-point.

He had noticed a slight whining noise from the rear but wasn't too concerned, and just ignored the noise. He did apparently plan to ask me to change the diff oil the next time he brought the motor into the workshop. But the Land Rover did not make it that long.

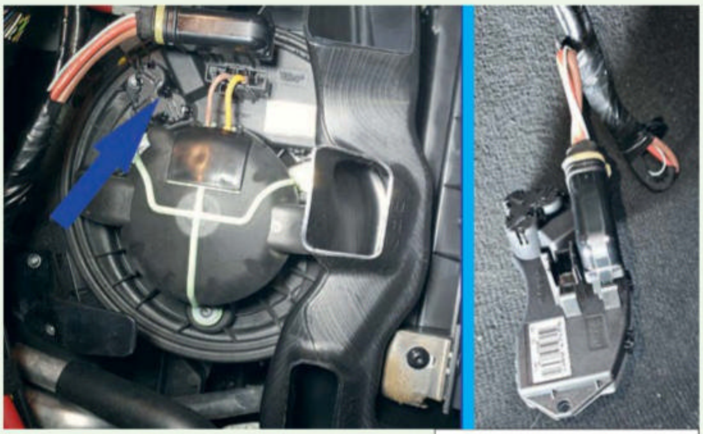
On the next trip to convey the mini digger to the building site he was working on, there was a loud crack from the rear, followed by a loss of power and a jolt as the motor came to an abrupt halt. Getting out and walking round the back he could see a messy black liquid under the rear axle.

Plans were made to get his digger to site and the Discovery to my workshop. The rear diff was in quite a mess and replacement unit was sought.

Catching this problem earlier would have certainly saved the owner a few quid.

BMW 1-SERIES

Flat battery bother



The battery had been drained down by the electronic heater blower rheostat which had kept the fan turning with the ignition off. This is easily removed without disturbing the blower fan.

Coming out to their 2005 BMW 120i one morning, the owner was quite upset to find that the battery was flat. It was so flat that nothing worked and gaining entry with the key they summoned a friend to give them a quick jump-start. At first, they suspected having left something on which had drained the battery, but after jump-starting the engine they then suspected that the battery had simply failed dramatically overnight.

A new battery was purchased and fitted, which then showed up the true source of the problem, the heater fan was running constantly. Phoning me up to ask where the fuse was located, I guided them to the main heater control fuse in the interior glovebox – once this was removed the fan stopped spinning.

The source of the problem was the fan control module, which is the rheostat and controls the speed, in a similar manner to the hedgehog-type rheostats fitted to some BMWs. When this fails it can allow a constant feed to the heater motor which will drain down the battery. This is easily accessible and once the new part arrived it was fitted in place, curing the constantly turning heater fan.

NISSAN NAVARA

AFR sensor

Just to throw a little confusion into the mix, I thought I would title this piece AFR sensor. The Air-Fuel Ratio (AFR) sensor is also known as an Oxygen Sensor (O_2S) or Lambda sensor, and it is good to remember that different people can describe the same component in different ways.

I do know that this can cause confusion, and it is why generally we try to stick to the same descriptions.

This 2015 Nissan Navara 3.0 diesel was displaying the engine management light and when checking the code P0135 appeared. This code was indicating that the heated oxygen sensor 1, bank 1, heater control had a circuit malfunction, and so the first check was the circuit and the connection to the sensor.

With this conformed as being in good order and operating correctly, using an ohm meter on the sensor it was confirmed that the heater element in the sensor had failed and was now open circuit.

The remedy was a simple replacement and once the new O_2, Lambda or AFR sensor was renewed and the code cleared, the engine management light was extinguished and stayed out.

The AFR sensor, also know as the O_2 or Lambda sensor required changing – and once fitted the EML could be extinguished.

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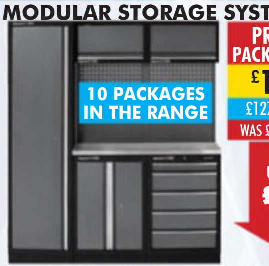

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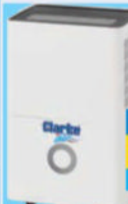

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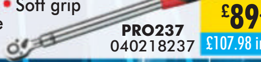

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Fight to the end

Part THREE: Martyn Knowles demonstrates how we renewed both front and rear shock absorbers on our NC model.

Shock absorbers (or dampers) aren't renewed that often. There was a time when changing shock absorbers was part of the service schedule at around 50,000 miles. Nowadays we wait for them to fail. Usually, a set of shocks are renewed due to one or both having a wet patch (fluid leak), normally noticed during the annual MOT inspection.

With 102,000 miles to its name, we thought it best to remove the original Bilstein shock absorbers fitted to our car and replace them with a set of... Bilsteins. The Sport Tech 2.0 model we have, has standard fit sports suspension featuring Bilstein shock absorbers and a strut brace assembly over the engine. My local MX-5 specialists (MX5 Restorer) told me that if you order OE parts from Mazda you will get a shock absorber designed by Mazda in collaboration with Bilstein with a dedicated part number for around £250-£300 each. What I've ordered from Bilstein is a set of B6 shock absorbers with a unique part number of 24-131742 for the front axle (£152.86 ea) and 24-131759 for the rear axle (£144.94 ea).

A B8 shock can be bought but that's for road/track use and the B14 is a height adjustable kit including road springs.

I can't yet tell you how good the new shocks feel on the road, because as you will read we had a troublesome moment with one of the rear anti-roll bar brackets – and we've yet to fix it. On my run back home (two miles) the MX-5 did feel like it could take corners with more enthusiasm, but I didn't want to put anything at full stress until we have fixed the problem.

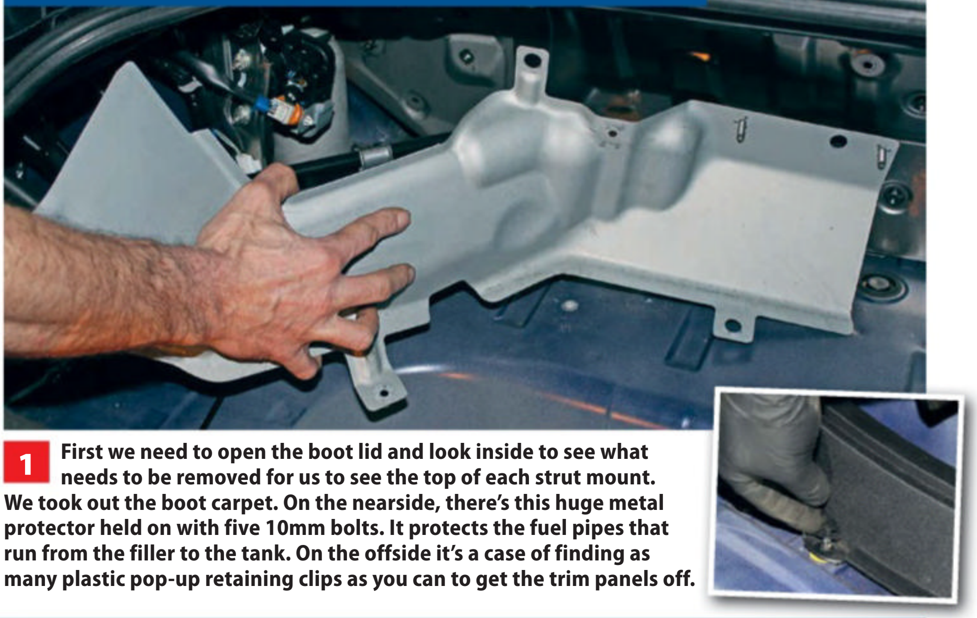
The MX-5 seems to sit a little higher than before, so I'm hoping after a few miles it will settle down to a lower level.

The reason for the title above – we also changed a few other parts while attending to this job. And nothing seemed to go to plan. With 15-year-old nuts and bolts to undo and droplinks that invariably never come undone with a spanner or socket, we saw angle grinding action, hammer blows, blow torches – and the occasional swear word.

We had Blue Print front droplinks to fit and rear anti-roll bar mounting bushes too. In error, I didn't order rear droplinks, but we found that they didn't need to be disturbed during the rear shock absorber swap – although other components around it did.

With two mechanics, Ben and Lee, on the job, and me taking photographs, we spent a good five hours in the workshop on a Monday night. We had use of a two-post ramp, which made swinging the hammer at the seized rear strut a bit more forceful. If you work on this job at home on axle stands, it's probably a good idea to find out first if the bottom of the rear strut will separate from its mounting point after removing the retaining bolt. As you will see we had lots and lots of trouble here on our offside unit.

REAR SHOCK ABSORBERS



1 First we need to open the boot lid and look inside to see what needs to be removed for us to see the top of each strut mount. We took out the boot carpet. On the nearside, there's this huge metal protector held on with five 10mm bolts. It protects the fuel pipes that run from the filler to the tank. On the offside it's a case of finding as many plastic pop-up retaining clips as you can to get the trim panels off.

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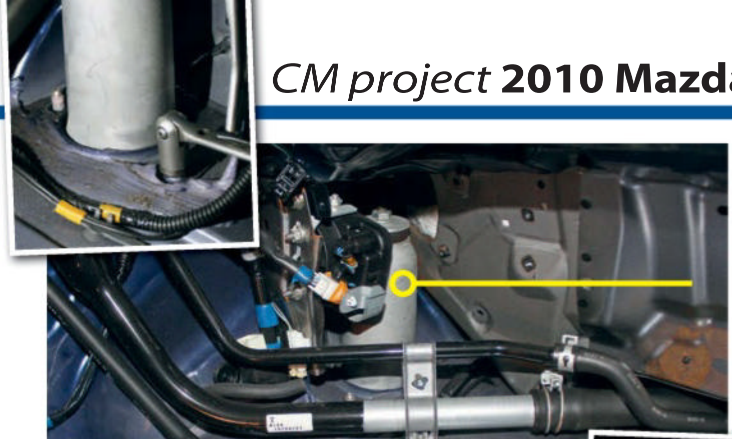
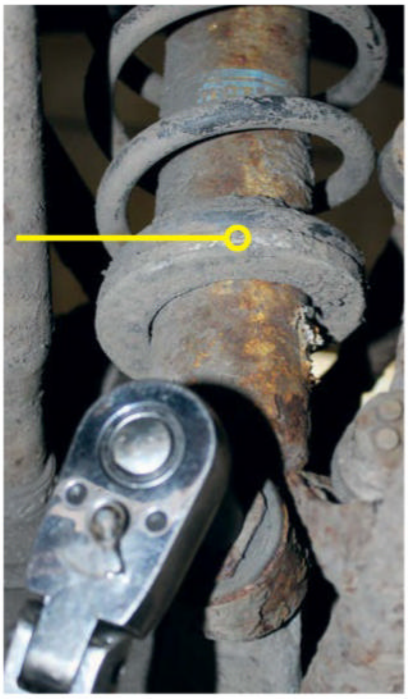
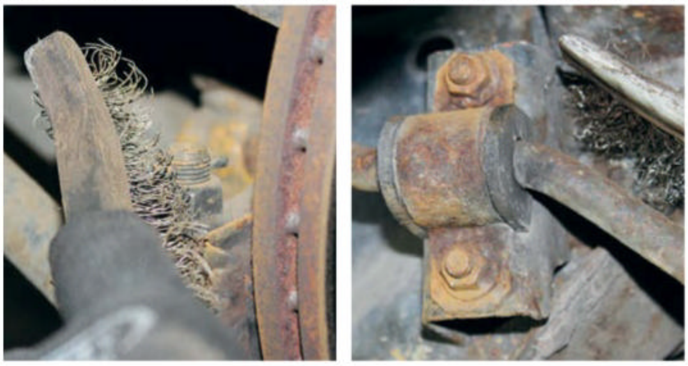


2 Each rear shock absorber sits inside a silver mount (arrowed). Two 14mm nuts are removed at each side of the mount and once the MX-5 is up in the air you will see one 12mm bolt located underneath the mount (in the wheelarch). Remove this (shown right) before we tackle the last bottom bolt which is where the trouble starts.



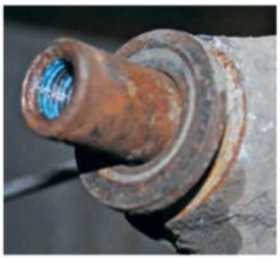
3 ◀ Our original-fit Bilstein's are looking fairly rusty on the outer body. We now tackle the 19mm lower fixing bolt. First on the nearside strut, then the offside. With the top of the strut loose and the loosened 19mm bolt driven out of the hole with a punch, we hit the lower body of the strut towards the middle of the car, to slip it from its locating pin. Hit it on the spring cup (arrowed) with a copper hammer – it will need a good few blows. The nearside started to move and we were free. The offside we couldn't budge!



4 We struggle to get the nearside strut down from is position due to suspension components being in the way. As we had new Blue Print anti-roll bar bushes to fit, we decided to take the old ones out – the bar could then swing down and out of the way. The rear droplinks move freely at the end of the bar. First, though, using a wire brush we cleaned up all nuts and bolts we thought we may need to remove.

5 ▶ With penetrating fluid on the anti-roll bar brackets, we undo the two 12mm retaining nuts OK on the nearside. The offside top nut comes off, but the bottom nut (as shown right) starts to spin on its own thread. It's a captive nut and behind the bolt there are no flats to get a spanner or socket on. Eventually the nut snapped off, leaving a stub protruding. We tried to hammer it out with a punch, but no joy. The guys then used an angle grinder to make it flush, so they could start drilling it out. Using an air drill, we attempted to drill this out for 20 minutes. We had to call time for now as we needed to get the main job (first).

6 ◀ To gain us room to drop down the strut we decide to undo the 19mm nut for the lower suspension arm (track rod outer) so that it could move sideways. This gave us the space – the strut was carefully lowered down and out. The below image shows the strut locating pin on the hub, which the offside strut had seized onto.



7 Back to the offside rear strut. We hit it again. It won't budge, so the guys decided it was time for drastic action. The angle grinder cut into the lower shock body, then a pry bar was used to open it up. It was hit again and we saw movement – not the shock absorber lower bush or its metal collar though, that stayed on the retaining pin. With the lower arm undone we could slide out the strut to the workbench. Now to tackle the stuck bush. It was heated with a blow torch, then a pair of locking pliers locked on, twisting the rubber bush back and forth. After a minute or so, with brute force, it started moving.

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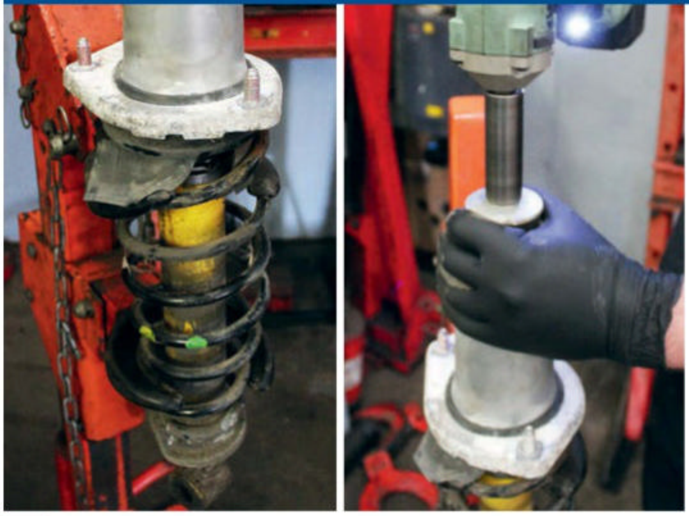
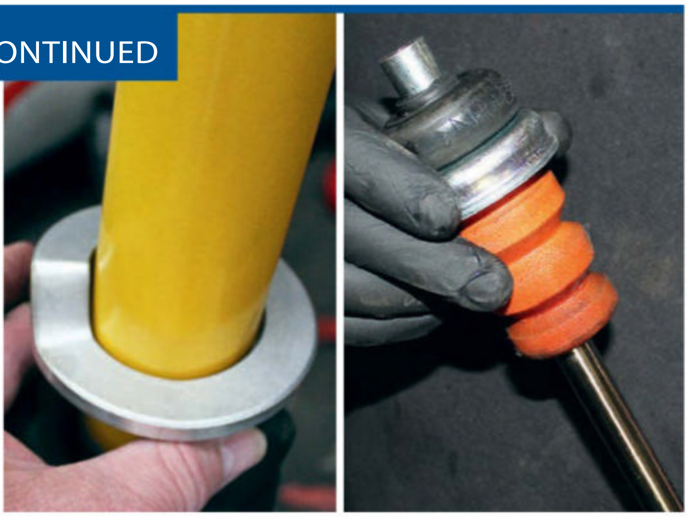
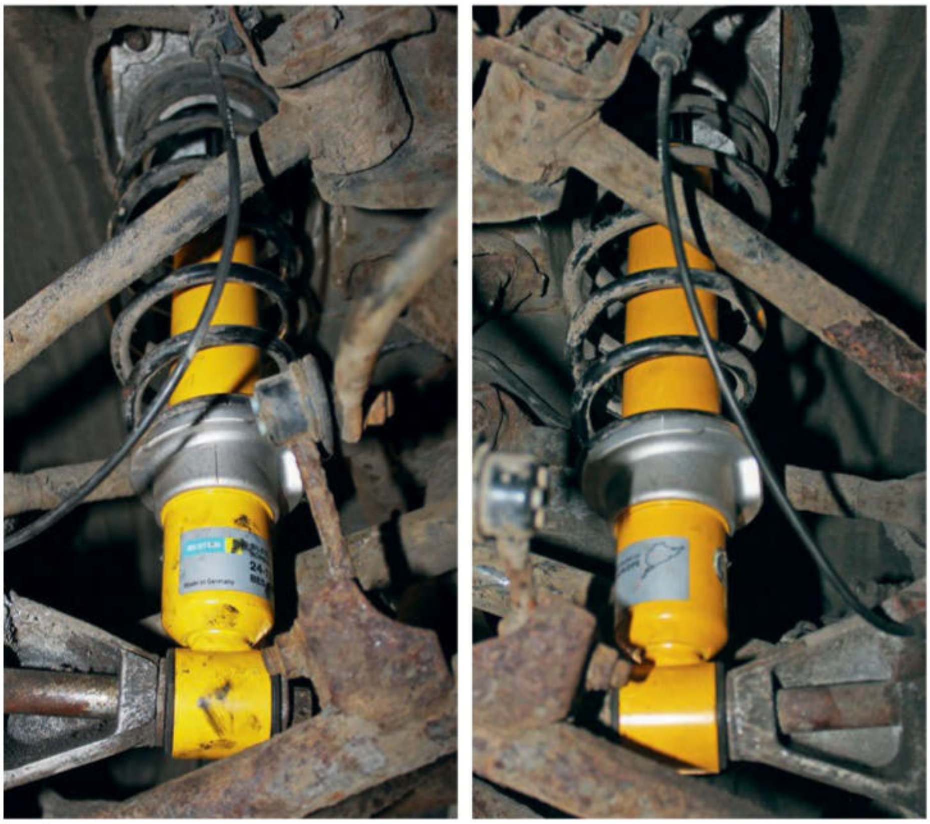
REAR SHOCK ABSORBERS CONTINUED



8 Each strut was placed into a spring compressor machine. With the road spring clamped down tight, the top 17mm nut was undone, while the shock was held by hand so it didn't fall on the floor. We noted the position of the shock absorber in relation to the strut top and spring cup, so that we could put the new shock in the same location – best to take an image on your mobile for future reference.



9 Each B6 Bilstein shock absorber comes with a fresh new spring cup. Slide it down the shaft of the new shock so it hits the retaining stop. Our road springs were in good order, hardly any rust on them. The original top rubber bush, metal collar and bump stop were also in remarkable condition for their age. They sit in the silver mount so are kept away from the outside world. We slide these onto the top of the new shock and feed the assembled shock into the centre of the road spring, locating the bottom of the spring with our new cup. Now to tighten the 17mm top nut and torque it to between 38Nm and 46Nm.



9 We can now offer up the newly assembled struts into place. It's easier to fit the lower part of the shock onto the locating pin first, then get the 12mm bolt into the top of the strut up under the wheelarch. Then you can screw on the two 14mm nuts in the boot. We cleaned up the 17mm bottom bolt on a bench grinder wire wheel, poked it through the bottom of the shock and added a dab of thread-lock to the thread before tightening to 100Nm. The two top 14mm nuts inside the boot are then tightened (no torque setting was found). With the strut in place we can refit the lower arm's 19mm nut and tighten that to 120Nm. Then offer up the anti-roll bar for refitment after putting in new rubber bushes. Now to clean our new shocks of hand prints.

REAR ANTI-ROLL BAR BUSHES

www.blue-print.com
ADM58058

Blue Print makes these rear anti-roll bar bushes to fit the MX-5 Mk3. As long as your bracket nuts come undone OK, it's literally a five minute job to take out the old and insert the new (both sides). Expect to pay around a tenner each for them. They have a split in the base so they slide over the bar before clamping down again.

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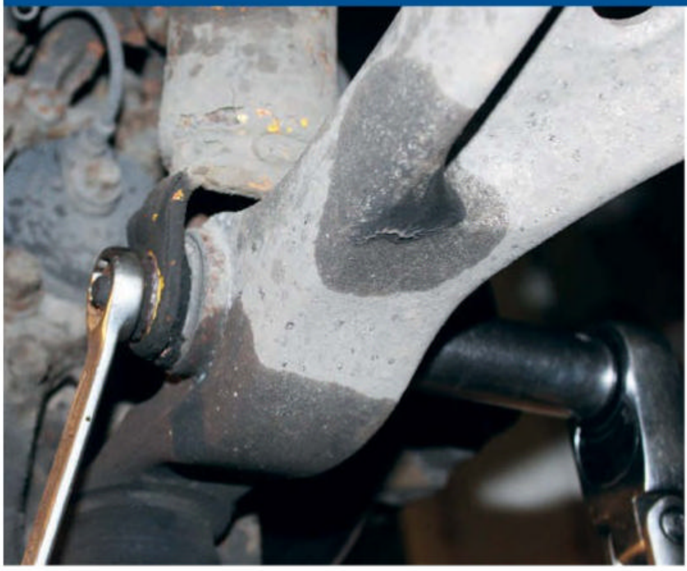
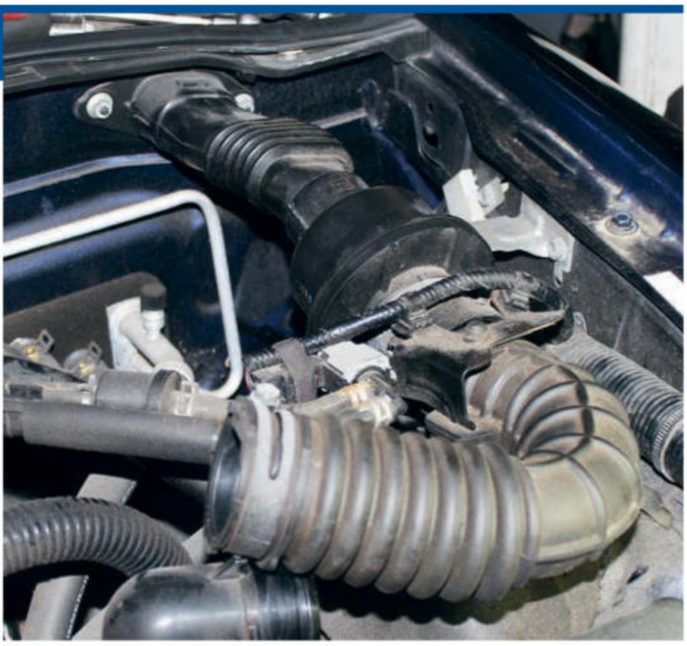
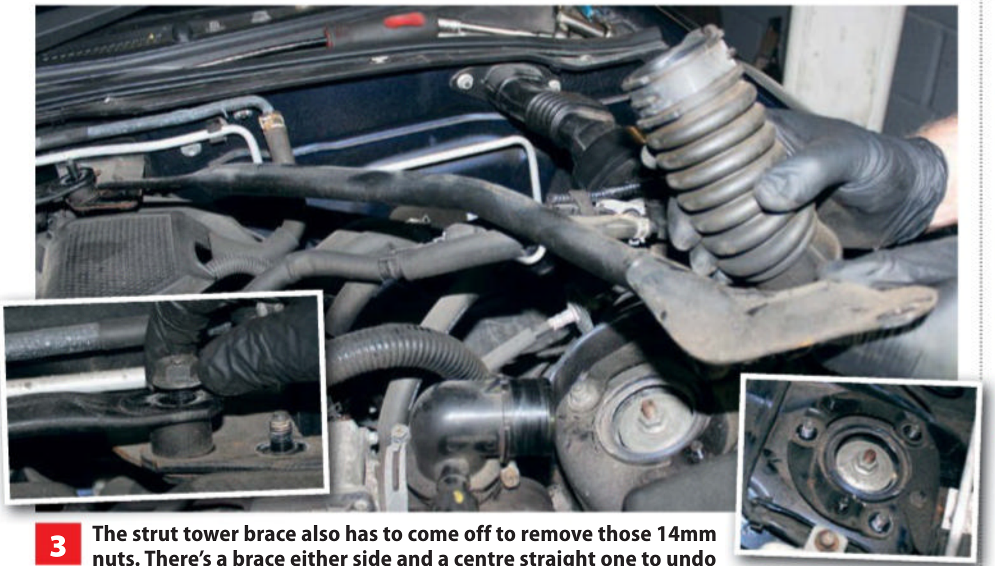
FRONT SHOCK ABSORBERS



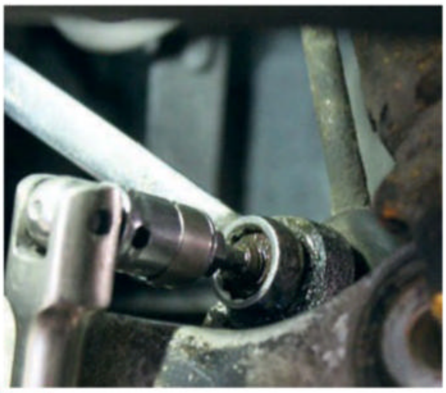
1 We start by undoing the bottom of the original shock absorber with a 17mm socket one side and a 17mm spanner on the other. It's tight, but the long ratchet is strong enough to get it turning eventually. We punched out the bolt and cleaned it up on the wire wheel machine.



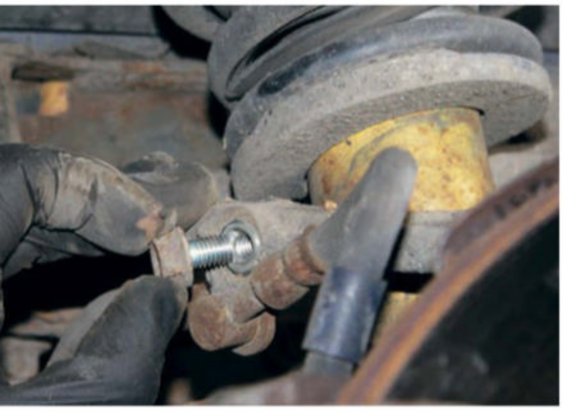
2 We drop the MX-5 down a little on the ramp to gain access to the engine bay and the three strut top nuts (14mm) on each side. The nearside has this trunking hindering our task, so we prise the trunking from its base and remove the top as shown here.



3 The strut tower brace also has to come off to remove those 14mm nuts. There's a brace either side and a centre straight one to undo in between. We can now progressively undo and remove the three strut nuts from each turret.

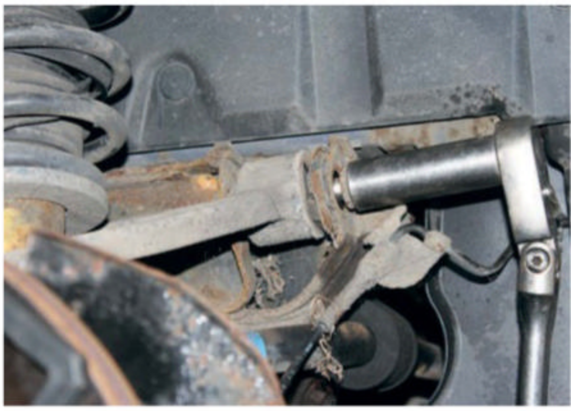


4 We had new front droplinks to fit, so we made an attempt at undoing the top and bottom fixings. A 14mm ring spanner and 5mm Allen key is used. They were so tight, Ben broke one of his Allen keys. After trying we were getting nowhere, so the angle grinder came out again to chop them both off through the holding nut.



5 ◀ We didn't know exactly how to remove the strut. We couldn't pull the lower part of it from its location as we needed to manoeuvre the suspension down to get it out. We first thought the brake hose line attached to the upper wishbone needed to be removed to give us that movement, but we needed more...

6 ▶ ...so the two upper wishbone mounting bolts (17mm) were taken out from each side of the strut. They undid easy enough and we soon had the suspension and brake disc tilting down to give us the much needed room to slide out the complete strut.



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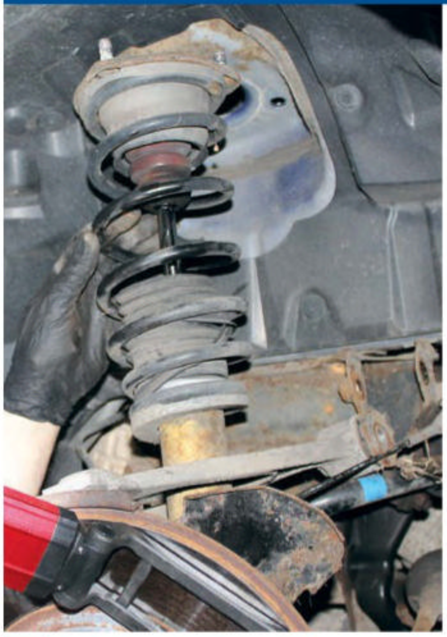
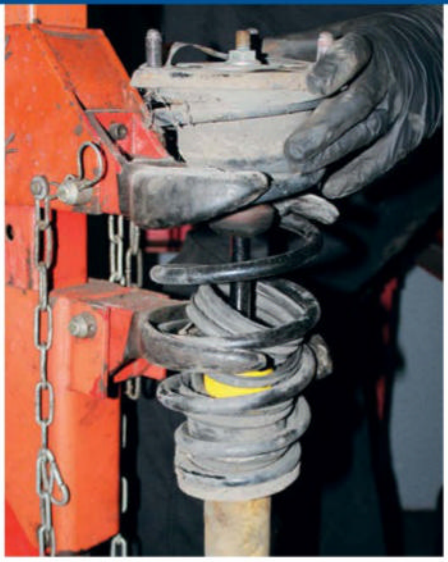
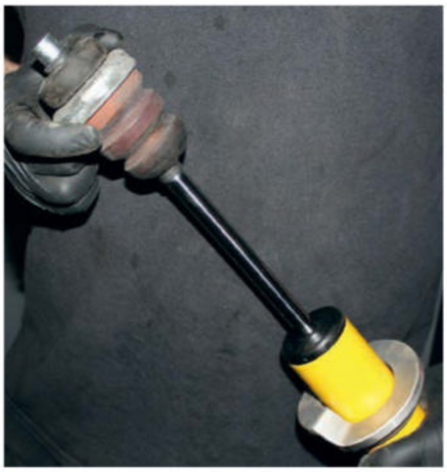
FRONT SHOCK ABSORBERS CONTINUED



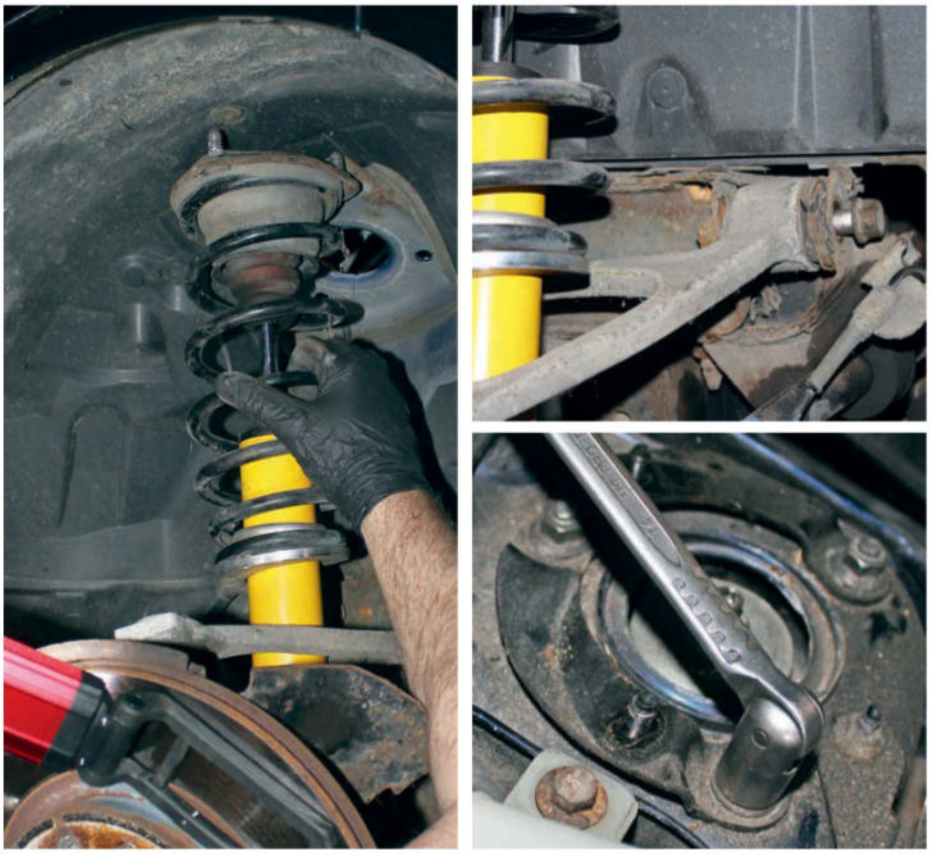
7 Carefully we pull out the strut from the top and manoeuvre it from the bottom hub before pulling it away from the wheelarch.



8 As with the rear, we mount the strut on the spring compressor machine to compress the road spring. I'm disappointed with myself that I didn't order up new dust covers. The originals disintegrating on removal and we couldn't reuse them.



9 The new spring cup goes on first, then the original bump stop, stopper casing and rubber top – all these still in excellent condition for the age of our car.

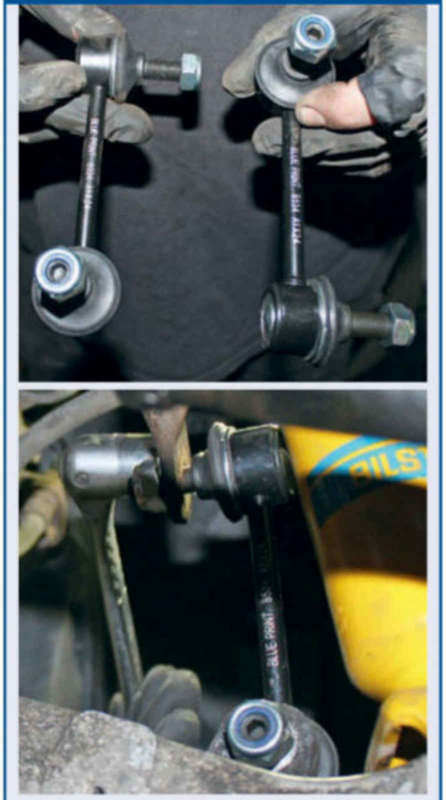


10 With the shock absorber 17mm top nut secured tightly, we uncouple it from the spring compressor and position within the wheelarch, locating the three top protruding screws in the relevant holes in the engine bay. All three 14mm nuts are tightened progressively and with the bottom of the strut located on the hub, the 17mm bolt is pushed through the hole and the nut tightened to 90Nm. The upper wishbone arm 17mm bolts are refitted and also tightened to 90Nm.

USEFUL CONTACTS

bilstein group partsfinder
partsfinder.bilsteingroup.com
Bilstein Suspension Store
www.bilsteinsuspensionstore.co.uk
The MX5 Restorer (East Sussex)
www.themx5restorer.co.uk
Vasstechnik vasstechnik.co.uk

FRONT DROPLINKS



Blue Print designs these new droplinks (also known as stabiliser links or anti-roll bar links). They are sided – ADM58544 (left), ADM58543 (right) at £18.84 each. Much easier to fit than take off the old ones.

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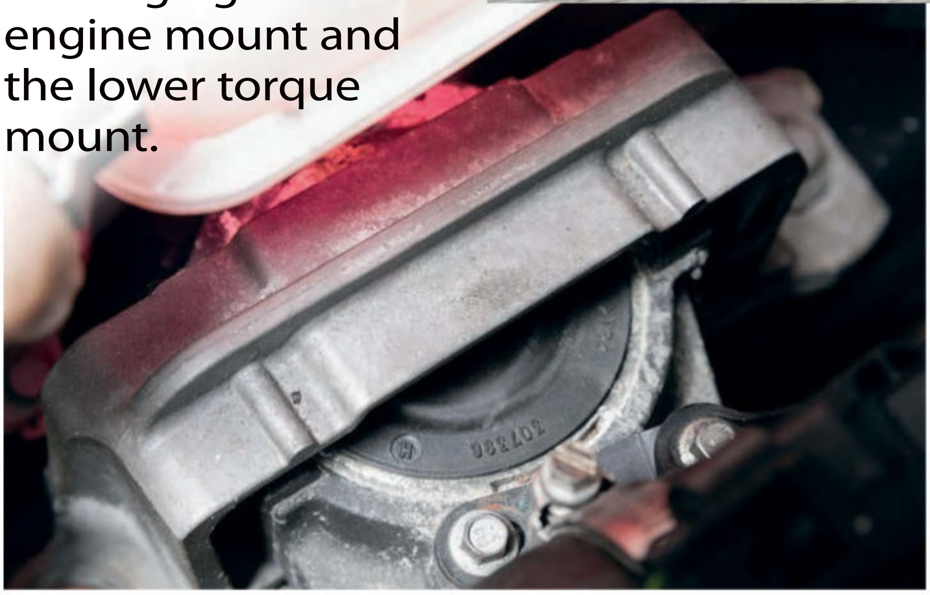
Project Ford Focus 1.0 EcoBoost

Focus Mk3

Part FIVE:

James Burr changes a failing right-hand engine mount and the lower torque mount.



HELPFUL TOOLS

- **Torque wrench**

TORQUE SETTINGS

Engine mount to chassis	**90Nm**
Engine mount to engine bracket	**80Nm**
Studs to engine bracket (if removed E11 socket)	**10Nm**

On most cars, including the Ford Focus, engine mounts are expected to remain effective for 60-100,000-miles. That said, it seems that many Mk3 variants have a common problem with the right-hand upper engine mount, and we've seen these fail in cars with as low as 20,000-miles. While this can also indicate how hard these cars have been driven in their lifetime, in most cases this is simply due to deterioration of the standard part.

An important chassis component, the right-hand mount is filled with oil and, over time, the rubber can degrade causing seepage and rendering the mount ineffective. This tends to throw up all sorts of running problems.

The upper engine/gearbox mount on the other side, which is located under the battery box and air filter housing, can also be changed of course, using much the same process. But these are much less prone to failure. This means that we'd always opt for the changing right-hand mount (and the lower torque mount) first.

Engine mounts are designed to absorb shocks and vibrations while holding the engine and gearbox in place. This ensures that the worst vibrations aren't passed through the rest of your vehicle. These anti-vibration properties are also important in the smooth running of your car when driving.

Mounts are classed as a chassis part and even partial failure can have an adverse effect on handling. An engine mount that isn't doing its job not only causes vibrations through the seat and steering but can also lead to excessive lurching when starting or stopping the engine, under braking or changing gear. In some cases – where the metal parts of the mount are allowed to touch – there can also be various clunks and impact noises.

On the Focus EcoBoost in particular, failure of the right-hand mount commonly leads to a bizarre whiny noise inside the cabin while idling, not unlike a fault with the heater blower. Most importantly, in all cases, excess movement will ultimately lead to damage to the engine and gearbox.

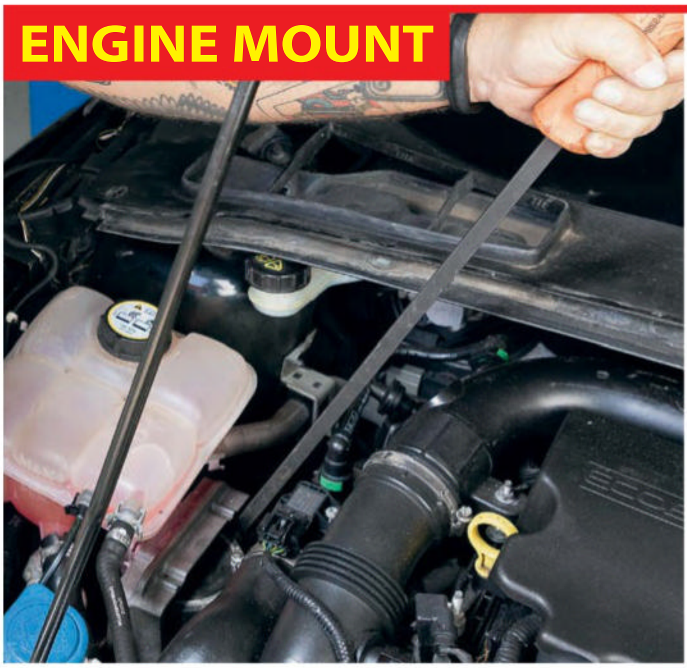
When buying any car look for excessive engine movement, along with strange interior noises and vibrations. For the Mk3 Focus specifically, this car is put together to be a smooth, comfortable runner, so any vibrations that seem to be heavier than you expect can not only point to a problem, but also indicate how the car has been driven. Ultimately this can indicate how the car has been looked after.

Conversely, if the engine mount looks brand-new on a high-mileage car, chances are that it is. So, it's always worth questioning (and of course, studying the service history closely) as to when and why it was changed.

All that said, it's merely a bargaining chip, rather than deal-breaker, because replacement is a relatively easy job. Oh, and let's not forget that, very often, you just know your own car, too. If something is amiss and your Focus just 'feels' rough, trust your instincts. In this case, the right-hand mount is always a good place to start.

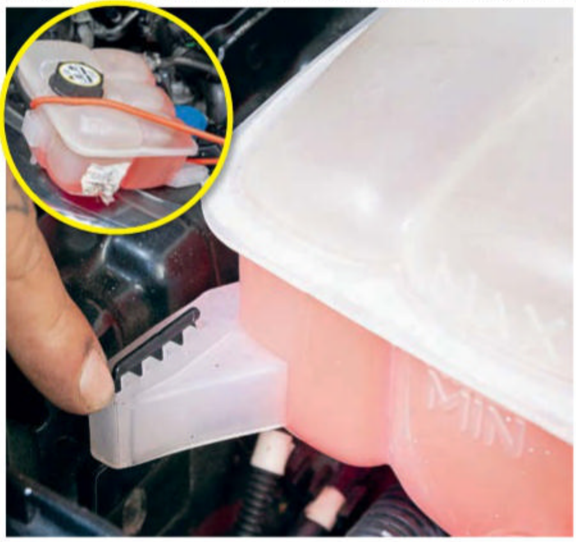
Note: For inspection and ordering parts, note that the right-hand engine mount is situated on the left side of the engine bay. This item is named for the driving position, as opposed to the under-bonnet view.

ENGINE MOUNT



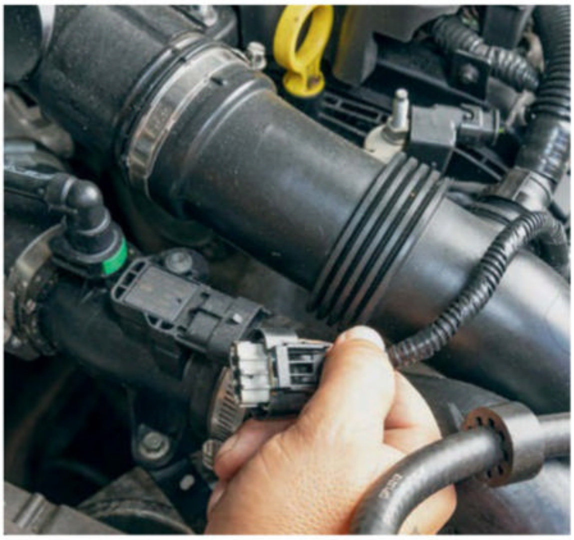
1 Diagnosis is a simple matter of using a pry bar to hold the engine mount solid while the engine is running. If this dramatically cuts engine movement and eliminates any noise inside the cabin, it is likely that your right-hand engine mount is faulty.

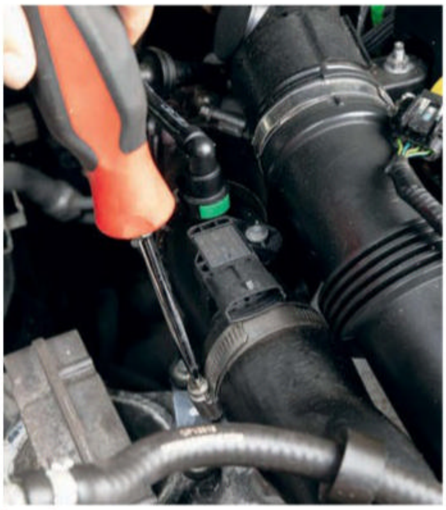
2 First support the engine with a jack and a piece of wood. Just under the gearbox is best. This is merely to take the weight off of the mount, ensuring the engine doesn't drop excessively when the mount is removed.



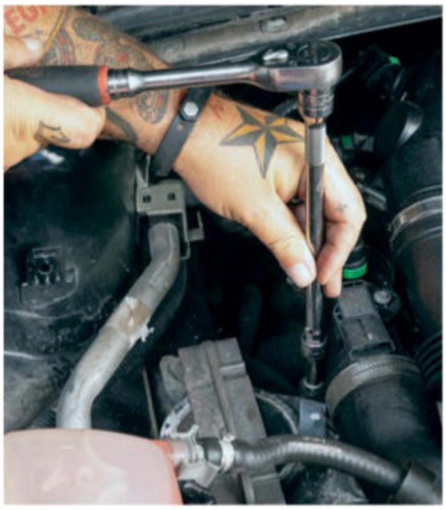
3 ◀ To gain access to the mount a few parts must be removed. First lift the coolant reservoir off of its two tabs – one at the back and one on the left-hand side. There is no need to drain your coolant. The tank can be secured out of the way, using a bungee can be helpful.

4 ▶ Remove the sensor plug on the top of the intercooler piping running over the top of the mount on the right-hand side.

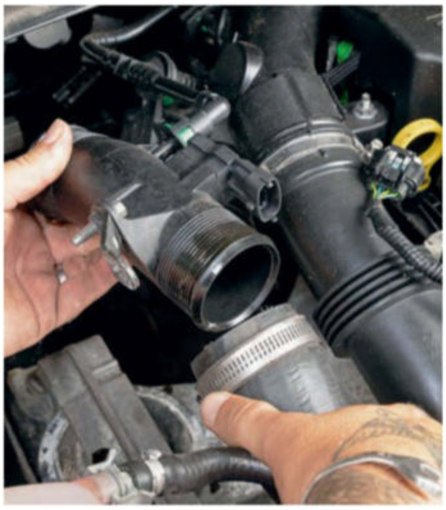




5 Loosen the hose clips on either side of the sensor using a screwdriver or hose clip remover.



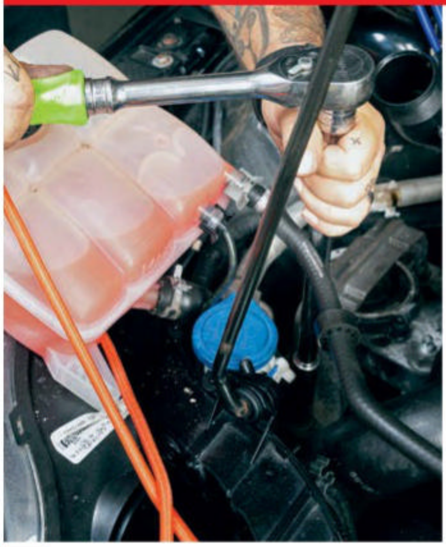
6 Use an 8mm socket and extension bar to remove the small metal bracket for the sensor module.



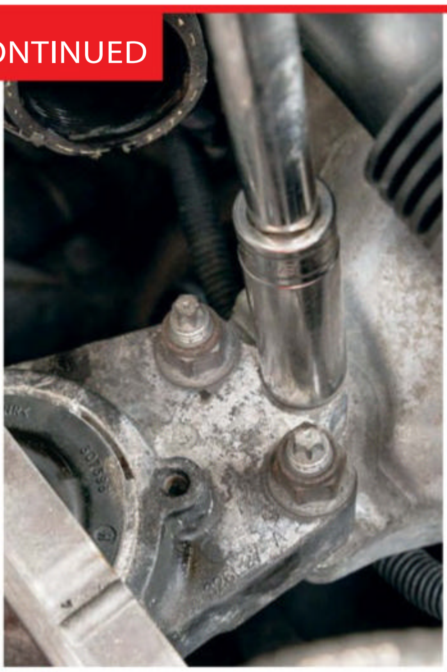
7 Now the intercooler hoses can be removed and the module secured out of the way.

⇨

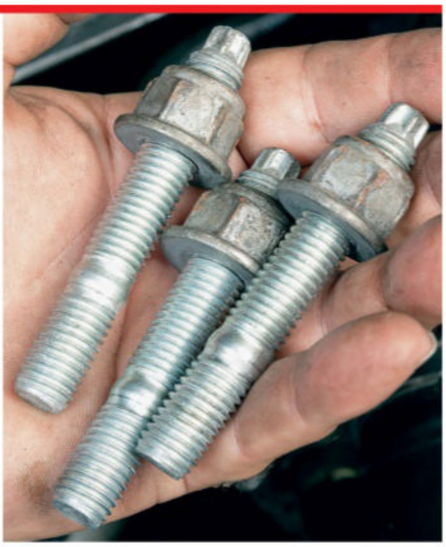
ENGINE MOUNT CONTINUED



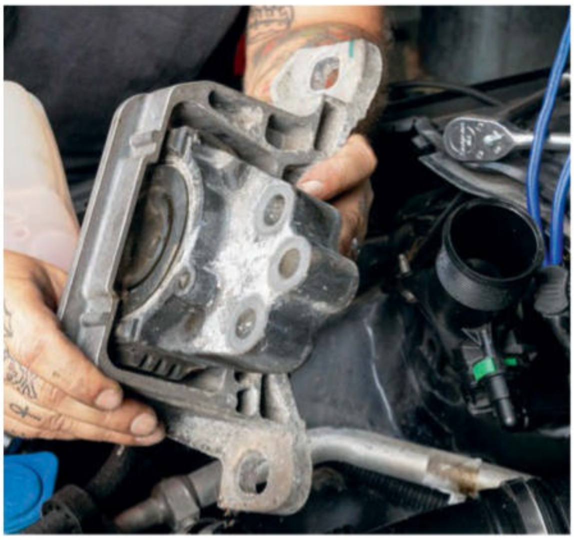
8 Remove the two 15mm bolts that secure the engine mount to the chassis leg. The engine is likely to move slightly, this isn't a problem as long as it remains supported.



9 Remove the three 18mm nuts securing the mount to the engine bracket.

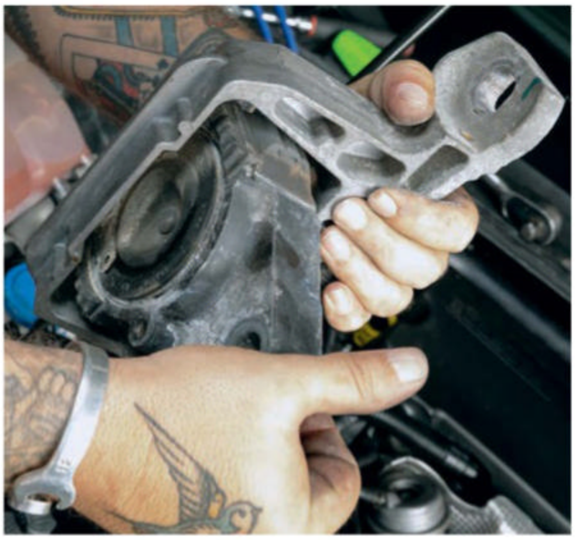


10 In most cases the securing nuts and studs will come away together. If the nuts and studs separate however, they can be installed separately later (just before Step 13) by using a E11 socket to install the studs before the engine mount. These need to be torqued to 10Nm.



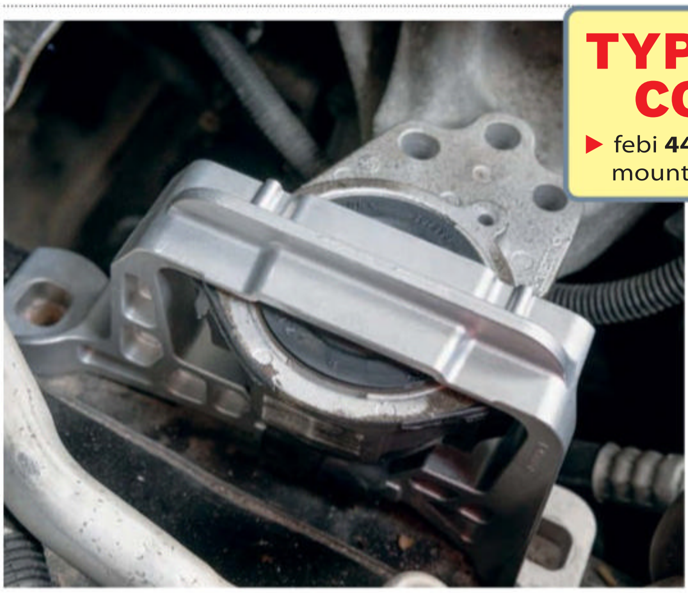
11 ◀ The old engine mount can now be lifted out of the engine bay. Be careful not to snag the mount body on hoses or any other parts during removal.

12 ▶ Engine mounts are designed to be firm, the movement in your old mount, respective to the new part, should give an indication of how worn it is. In some extreme cases you may be able to make each metal bracket touch, indicating a severe failure in the rubber bushing.

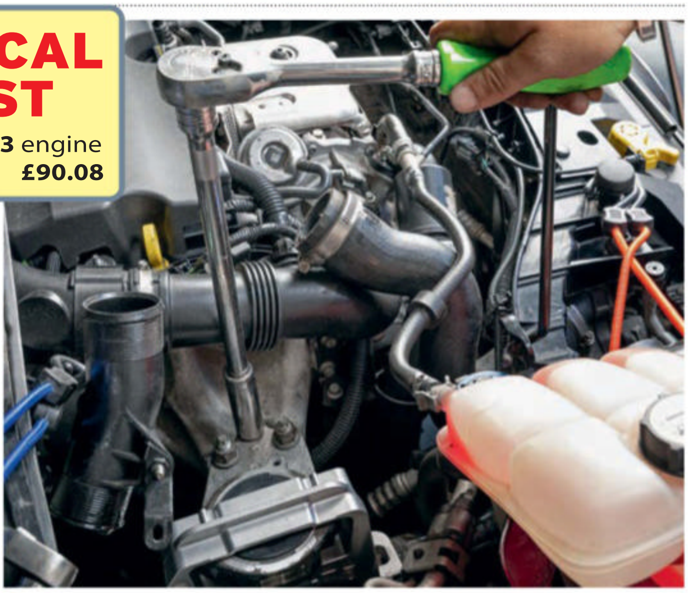


TYPICAL COST

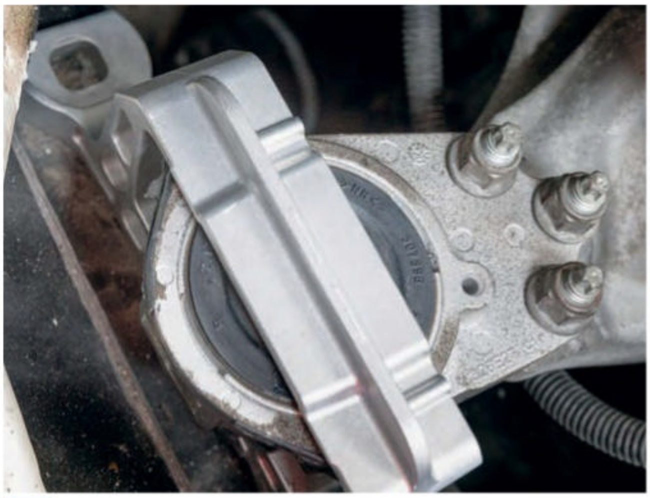
▶ febi **44493** engine mount) **£90.08**



13 Place the new engine mount in place lining up the three stud holes on the engine bracket first.



14 Reinstall the three studs/nuts, leaving them secure. You do not need to tighten them fully just yet.



15 The bolts for the chassis leg can now be lined up and reinstalled. It may be necessary to adjust your jack and hold the mount with a pry bar to get it in the correct position. The bolt holes and the edge markings on the chassis leg will indicate where this direct replacement part should sit. But, if in doubt, this can be marked on the old mount with a paint pen before removal, and the marks transferred to the new mount before installing. Tighten the chassis bolts sufficiently so there is no movement in the engine.

16 Torque the chassis to engine mount bolts to 90Nm.

17 Torque the mount to engine bracket bolts to 80Nm. Replace plastic intercooler pipe, sensor plug and coolant reservoir in the reverse order of removal.

PERFORMANCE UPGRADES

▶ For the most part performance engine mounts are designed with handling, rather than comfort, in mind. The rubber or polyurethane material used as the vibration isolator will be stiffer than the standard part offering a more direct connection with the drivetrain. These hold the engine in place (relative to the chassis) more effectively during hard cornering and braking. They also help to put the power down to the wheels when accelerating, and often offer a more precise gear change.

Not all performance mounts are equal though, the best quality items, designed specifically for road cars by the most reputable specialists, such as Vibra-Technics and Hardrace, offer similar vibration isolation to standard. This means that the vibrations in the cabin shouldn't be increased significantly as to make the drive uncomfortable (unlike near-solid mounts that may be used on a race car). These are available for the more performance-orientated variants of the Mk3 Focus.

LOWER TORQUE MOUNT

The lower torque mount – sometimes called the bottom engine mount or dog-leg/dog-bone mount – is a rubber bushed stabiliser which stops your engine tipping backwards and forwards during acceleration and braking. If you're looking down on any transverse engine and gearbox setup, typically the two upper engine mounts are in the middle on each side, holding the engine onto the chassis legs. Without a torque mount present the engine would be free to tip due to the inertia of the engine relative to use of the vehicle around it. Like other engine mounts, these will contain a rubber isolator to help absorb vibrations that would be transferred to the vehicle subframe – this stops the worst of them entering the cabin. This isolator typically degrades over time causing excess play which leads to the engine shifting weight while driving. This can cause lurching, adverse handling and, in extreme cases, stalling in between gear changes. In the case of complete failure, where the isolator becomes completely detached from the mounting, there will be a loud knock where metal contacts metal when starting, accelerating or stopping.

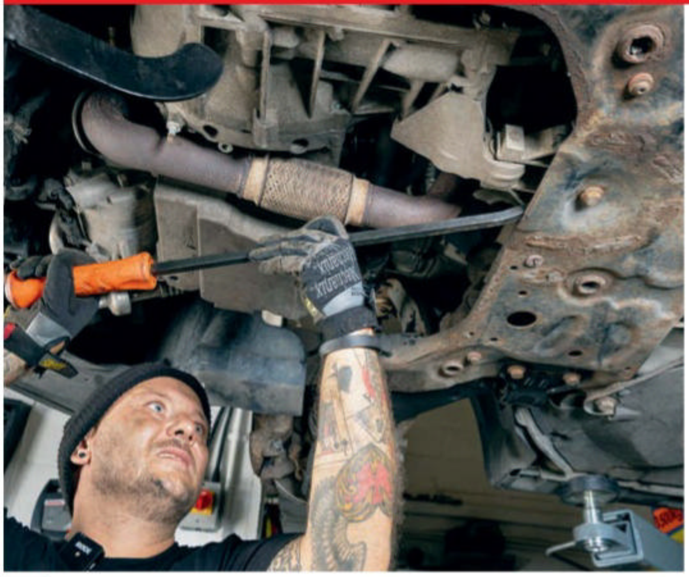
For the Mk3 Focus in particular, lower mounts can last for 60-100,000-miles but are known to become worn relatively quickly due to constant acceleration and braking, especially if other engine mounts are starting to fail and putting excess pressure on your torque mount. This is common in many city cars due to the nature of city driving, and doesn't necessarily mean that the vehicle has been driven harder than average. While this common fault may not cause noticeable vibrations in the cabin when at idle, it typically causes the engine to lurch back and forth excessively during driving and may cause an audible knock and a noticeable lurch on start-up.

When buying a used Focus, access for inspection underneath can be limited but rocking the engine slightly by hand can be a good indication of the condition of the lower torque mount.

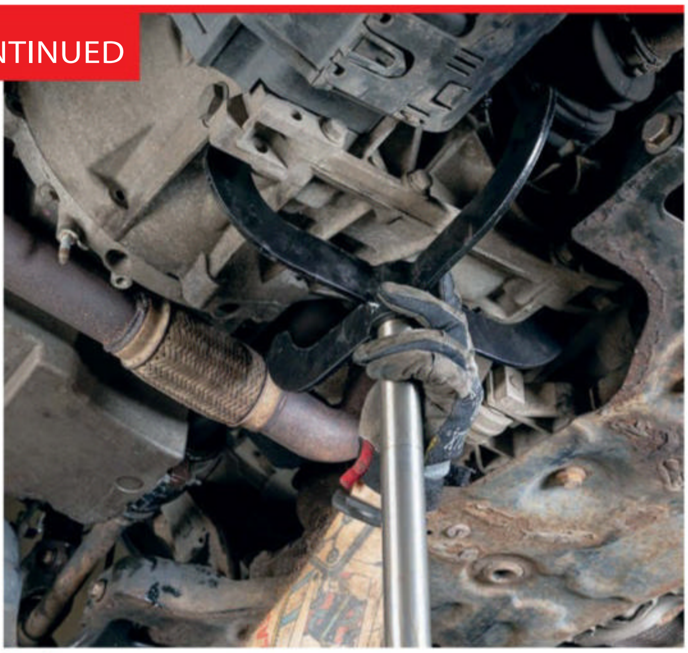
TORQUE SETTINGS

▶ **Torque mount to subframe**	**30Nm** then a further 270° (or 80Nm)
▶ **Middle bolt**	No specified setting, **70Nm** recommended
▶ **Torque mount bracket to gearbox**	**46Nm**

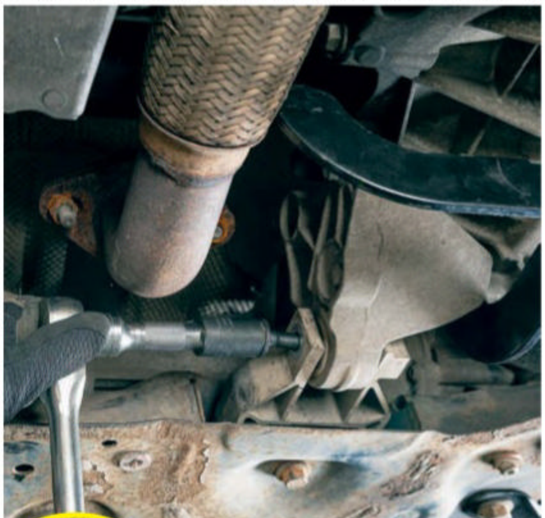
LOWER TORQUE MOUNT CONTINUED



1 First you need safe access to the underneath of the car, ensure that the front of the vehicle is jacked up and sitting safely on axle stands, floor ramps may also be used. Remove the lower engine tray. The lower torque mount is situated between the gearbox and the subframe and can be inspected for play using a pry bar, you can also try to physically move the engine and gearbox backwards and forwards. If it moves excessively, this points to a worn or failed mount.

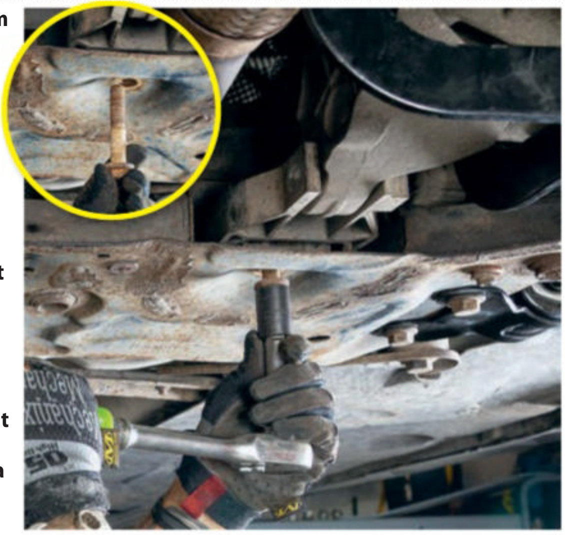


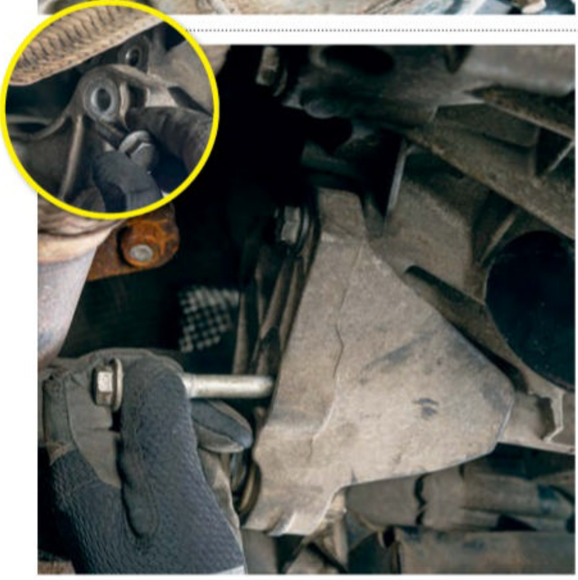
2 Before attempting to remove the mount, the weight of the engine and gearbox must be supported and the whole unit stopped from moving backwards and forwards. Here we're using a transmission jack, but, if the car is on the ground as opposed to a ramp, a trolley jack with a block of wood is sufficient. You only need to support and lift the engine very slightly to take the weight off the mounting (less than 5mm), making sure the car remains safely planted on the ramp/axle stands.



3 ◀ First remove the 15mm bolt which holds the lower mount to the gearbox bracket. This tends to make both parts easier to remove later than it would if the mount and bracket were taken out in one piece. The mount has a captive thread which holds the bolt, so there's no need for a spanner or socket on the other end to remove it.

4 ▶ Remove the 15mm bolt securing the mount to the subframe – again this has a captive thread at the top. Your mount should now be loose.



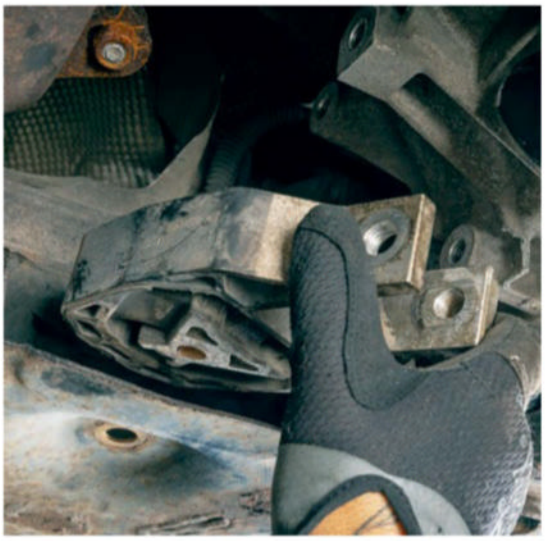


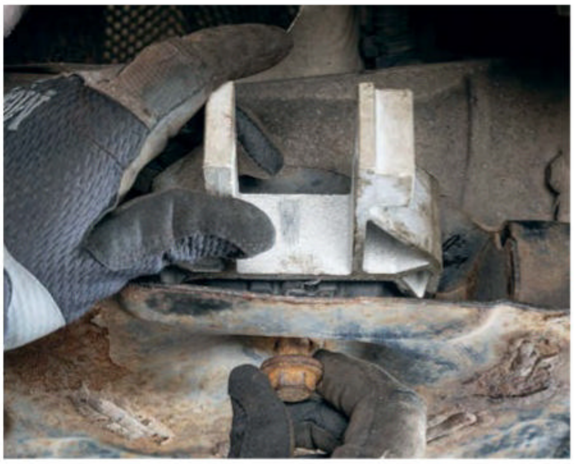
5 ◀ In order to remove the torque mount, the gearbox bracket should be removed using a 13mm socket. Remove the three bolts and slide out the bracket.

TYPICAL COST

▶ febi **45855** engine mount) **£30.40**

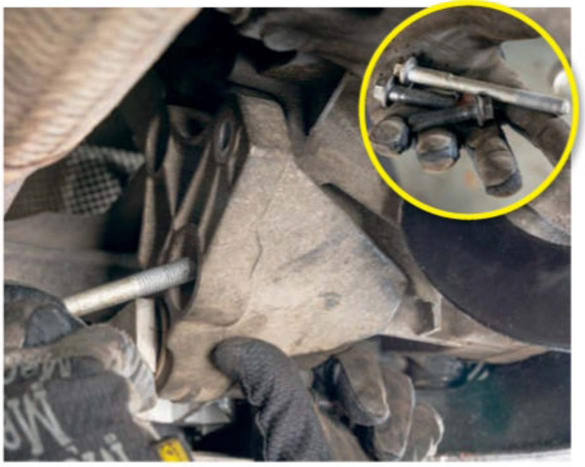
6 ▶ Now you should have just about enough access to slide out the old torque mount. Remove and compare the stiffness with your new torque mount.

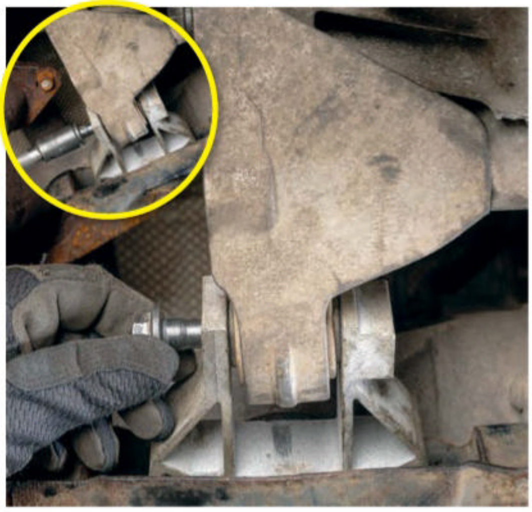




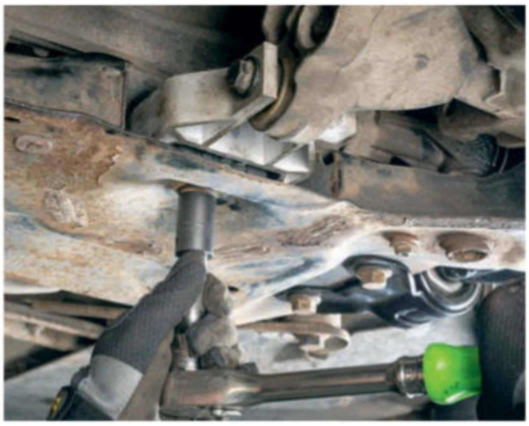
7 ◀ **Place the new torque mount into position, lining up the subframe bolt. Note that the captive thread for the middle bolt should be situated on the right-hand side. Install the subframe bolt but do not tighten fully just yet.**

8 ▶ **Reinstall gearbox bracket, noting that the longer 13mm bolt is situated at the bottom of the assembly. Again, do not fully tighten the bolts yet.**

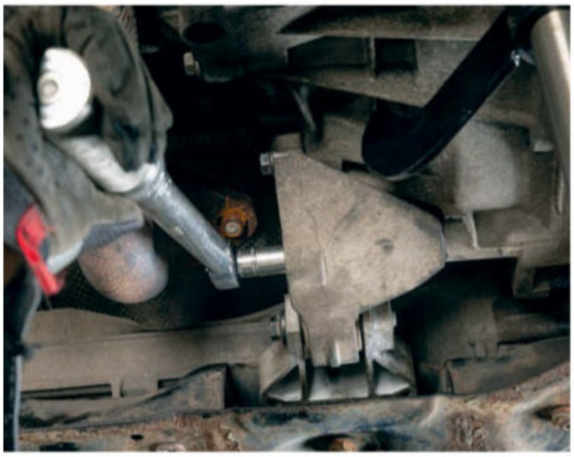




9 ◀ **Reinstall the 15mm bolt that secures the mount to the bracket. This bolt passes through the bracket bushing and can be fully tightened. There is no specified torque setting because this bolt is only under sheer stresses. Note: standard parts are constructed from alloy so proceed with caution when tightening this bolt – it doesn't need to be as tight as a wheel or subframe bolt – most specialists suggest no more than 70Nm. Performance upgrades may come with a specified torque setting from the manufacturer.**

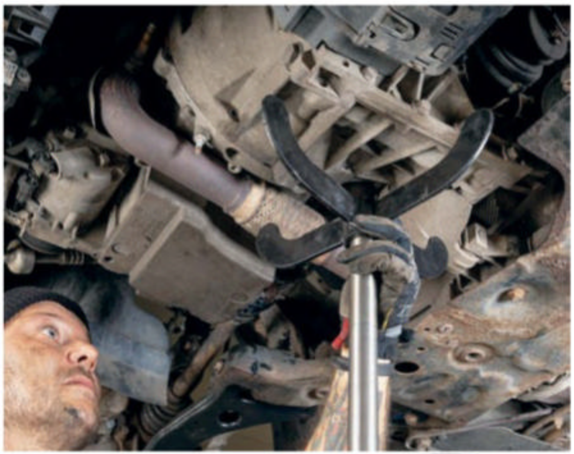


10 ▶ **Tighten the main subframe bolt. First this bolt should be tightened to 30Nm and then angle tightened a further 270°. Alternatively tighten this bolt to 80Nm. Ensure there is no excess movement in the mount or bracket.**



11 ◀ **Tighten the gearbox bracket bolts to their specified torque. The three bolts to the gearbox should be 46Nm.**

12 ▶ **Remove engine support and check engine for movement top and bottom – excess movement may indicate wear on other engine mounts, so it's always worth checking.**



PERFORMANCE UPGRADES

▶ While we'd always recommend looking for a reputable brand (such as febi bilstein) for standard parts, like other engine mounts, performance upgrades are available.

On the Focus in particular, aftermarket upgrades are typically geared towards the more high-performance variants such as the ST models. These vibration isolators are usually made from polyurethane or harder rubber to further limit engine movement during more spirited driving. This results in a stiffer chassis, better handling (with regards to acceleration, braking and weight transfer) and a more precise gear change. These are also built for extreme durability over standard rubber items and will not degrade over time in the most extreme conditions. Some companies even offer an extra bushing for the gearbox bracket.

In most cases (but, notably, not all) performance torque mounts are intended for fast-road and track use and may increase the vibrations transferred to the cabin, this is seen as something of a trade-off for the performance benefits.

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Exhaust issues

Rob Hawkins gets to grips with replacing exhaust systems and rear silencers and discovers what's involved in making custom components.

The exhaust system on a vehicle is one of those fit-and-forget components that doesn't need any attention until something goes wrong with it, such as a leak, a rusty hole or a broken mount. The work involved in replacing parts or fixing problems is often varied, so we've tried to provide an overview of what's usually involved, but appreciate there are many more examples to cover, such as when to use exhaust paste or a sleeve.

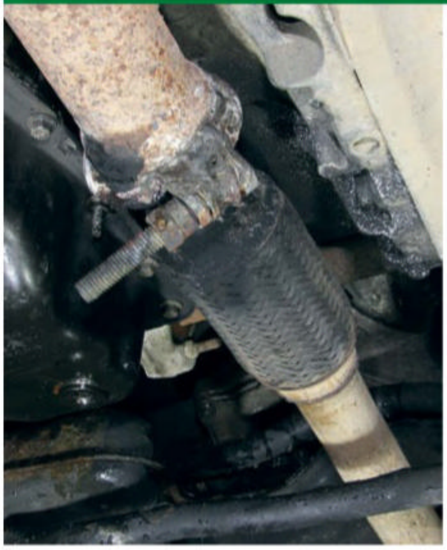
The longevity of an exhaust system is something that's almost impossible to predict and a subject that surprises us at *CM* on many an occasion. The 2016 Peugeot 2008 that's shown in our photographs was 8.5 years old when its exhaust system had got to the limit of being patched up, which means it had started to fail much earlier than this point. And with less than 65k on the clock, it surely should have lasted longer than this.

There's perhaps no point in guessing or assuming how long an exhaust system should last for, especially judging by the steps we've revealed on the Mazda MX-5 Mk2 shown here where a budget-priced rear mild-steel silencer, which was fitted in 2013, lasted for almost 12 years (the mileage in that time was low at around 20k).

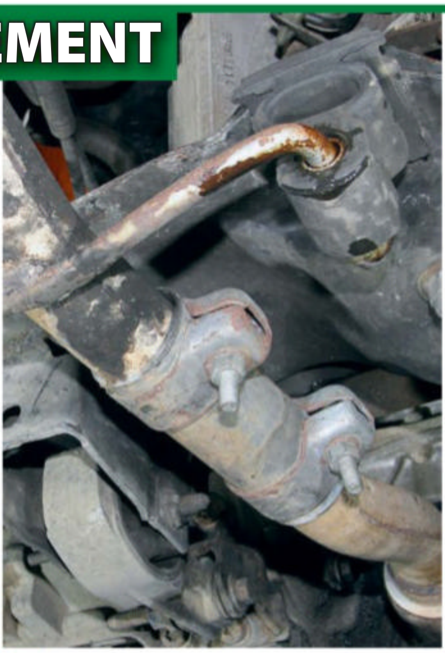
For peace of mind with an exhaust system, perhaps one with a lifetime guarantee is the answer, so we followed one being made for a Ford Fiesta ST at specialist fabricator Tony Banks.

THANKS TO
AES York Ltd 01904 780149
autoelectricsyork.co.uk
MJ Motors 01924 472404
Tony Banks 0113 2798944
www.tonybanks.co.uk

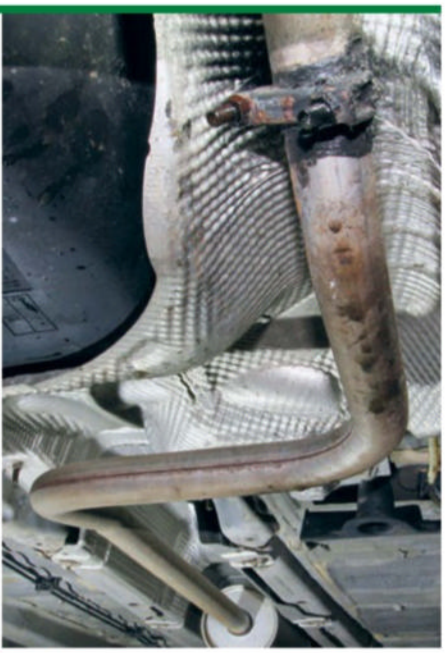
SYSTEM REPLACEMENT



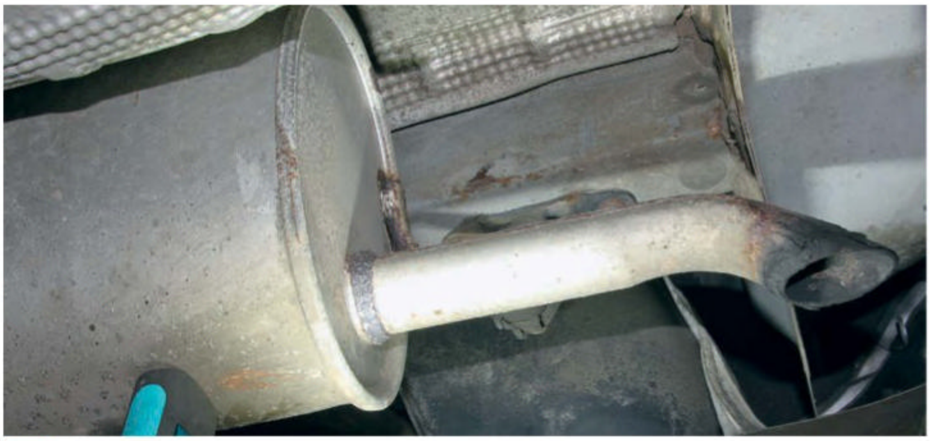
1 **The exhaust on this 2016 Peugeot 2008 could be heard blowing and when we looked underneath, we could see that judging by the amount of soot, it was probably from this flexi-pipe, which is attached to the downpipe and catalytic converter.**



2 **Looking at this sleeve, the exhaust system had clearly been repaired before, and the traces of soot suggested it was now blowing. It was definitely time to replace the entire system instead of patching it up.**



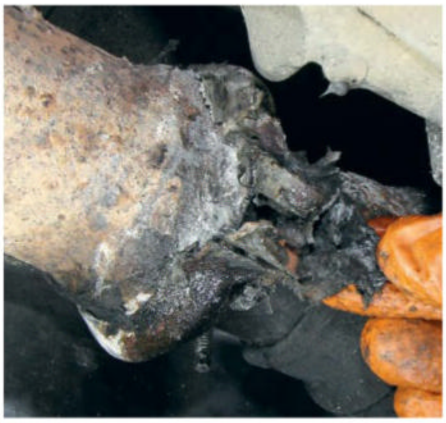
3 **Further along the exhaust system, the rear silencer section was attached with a clamp and seemingly lots of paste. Whilst it appeared to be intact, we were cautious over what was lurking inside.**



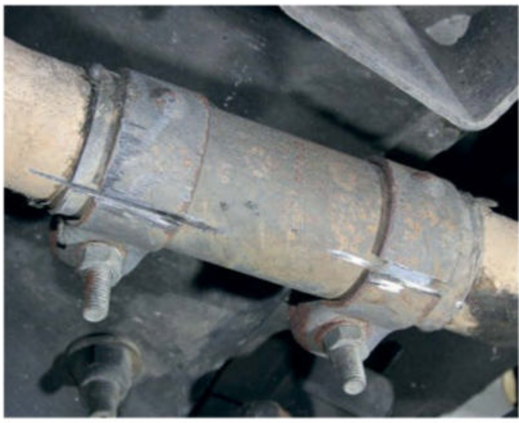
4 And the tailpipe had clearly seen better days. There was more than a little black soot on the end of it. The metalwork had started to crumble with corrosion. We couldn't shake the silencer, but wondered what had broken down inside it.

5 After deciding to remove the entire system from beyond the downpipe/cat, we sprayed penetrating fluid over all the fastenings. Rob was hopeful he could undo this clamp, whereas mechanic Pete at AES had an angle grinder at the ready.

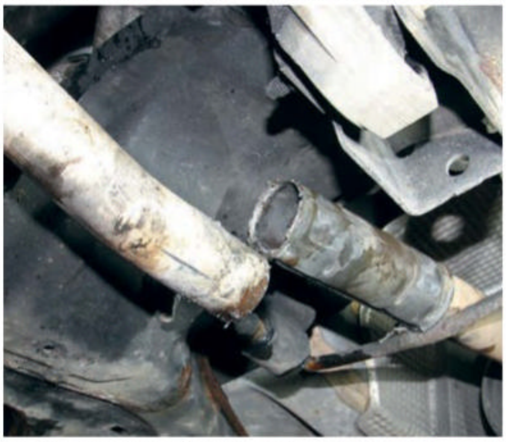
6 Sure enough, the clamp refused to move with a suitable socket, so Pete sliced through it with his angle grinder and cutting disc. He cut through the bolt, ensuring the clamp could be saved and reused.



7 Rob picked out what appeared to be the remains of silicone sealant. This is a more flexible alternative to traditional exhaust paste and providing it's the high-temperature type, it can seal up joins on an exhaust system.

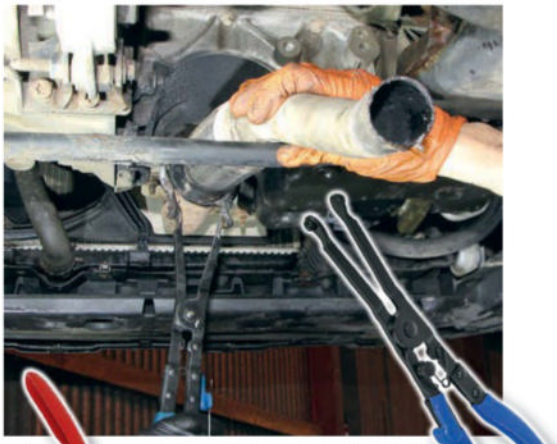


8 The sleeve outlined in Step 2 was also dismantled with an angle grinder, initially slicing through its two clamps to slacken them, but then cutting through them again to remove them and then slicing along the sleeve to release it.



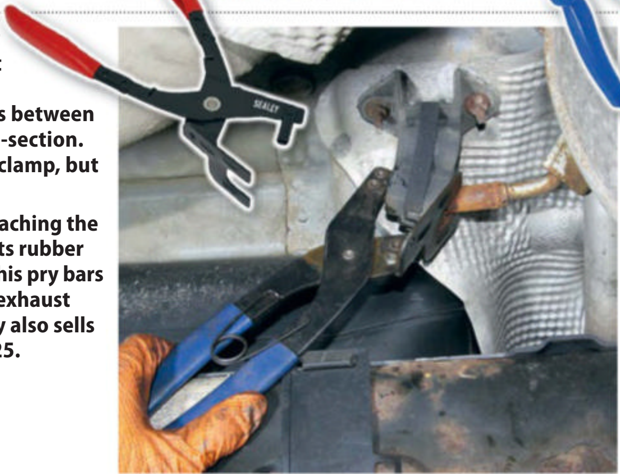
9 ◀ Eventually, the sleeve was moved along the mid-exhaust pipe towards the centre silencer, enabling the front section to be separated. The sleeve was removed, and we could now see that the pipework had been cut and sleeved to repair it.

10 ▶ Struggling to release the clamp between the downpipe and flexi-section, Pete came to the rescue once more with a pair of exhaust clamp spreader pliers that forced the clamp to open. These are available from Laser Tools (part number 4469) and cost £33.98 at Machine Mart (product code 040214469).

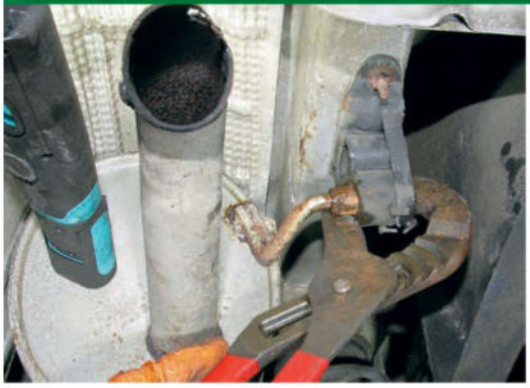


11 ◀ With the frontmost section of the exhaust system released, we had one more join to undo, which was between the rear silencer and the mid-section. Rob undid and removed the clamp, but the join was stuck.

12 ▶ Pete suggested detaching the exhaust system from its rubber hangers. Rob struggled with his pry bars until Pete gave him a pair of exhaust hanger removal pliers. Sealey also sells a pair (VS1631) for around £25.

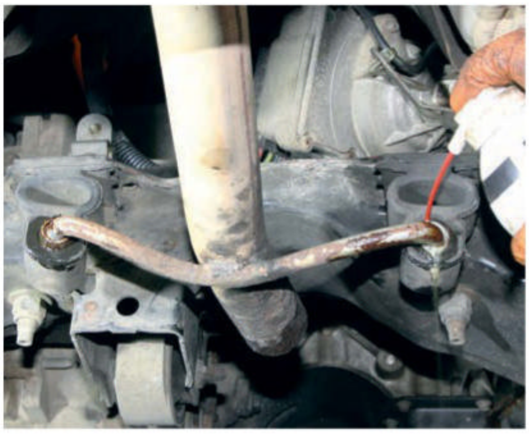


SYSTEM REPLACEMENT CONTINUED



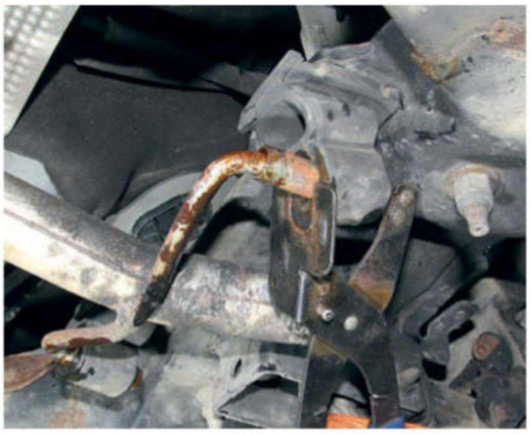
13 ◀ There wasn't the space to manoeuvre the exhaust hanger removal pliers into position on the rear silencer's hanger, so a pair of water pump pliers was used instead. Applying penetrating fluid also helped.

14 ▶ With the exhaust system released at the back, the rear silencer section was still seemingly superglued to the mid-section. The exhaust system could sit on the rear beam axle for now.



15 ◀ With one final pair of rubber hangers to release, penetrating fluid was sprayed into them to help ease the steel mounting pegs out. We were surprised at how much this helps, providing the fluid can get inside the hanger.

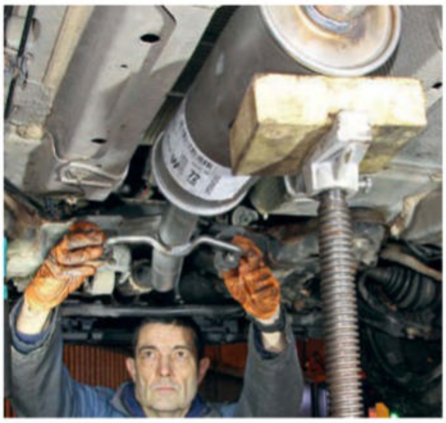
16 ▶ Armed with the exhaust hanger removal pliers, the final two hangers were straightforward to release. The entire exhaust system was now left suspended over the rear beam axle.



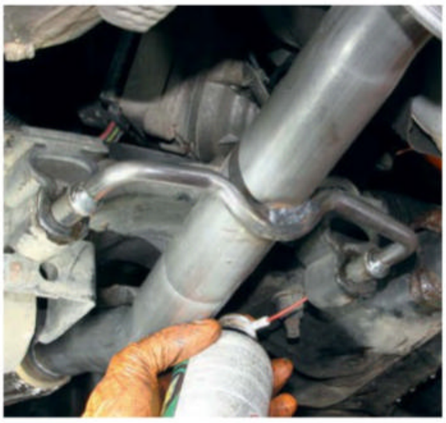
17 ◀ Realising the mid-section and rear silencer section were not going to part company that easily, Rob reached for the angle grinder and sliced through them with a cutting disc.

18 ▶ Gathering the remains of the old exhaust system on the workshop floor, we realised it had definitely seen better days and was ready to be replaced. We compared old and new to make sure we had the right parts.

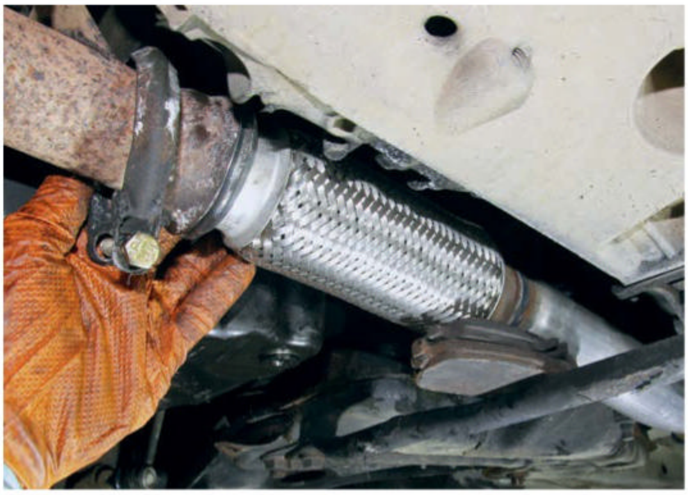
19 Mark Shipman at AES had cautiously ordered a new catalytic converter with a downpipe, just in case the end of it had corroded. On this occasion we were lucky, and the end of the downpipe was still intact. It was cleaned with emery paper.



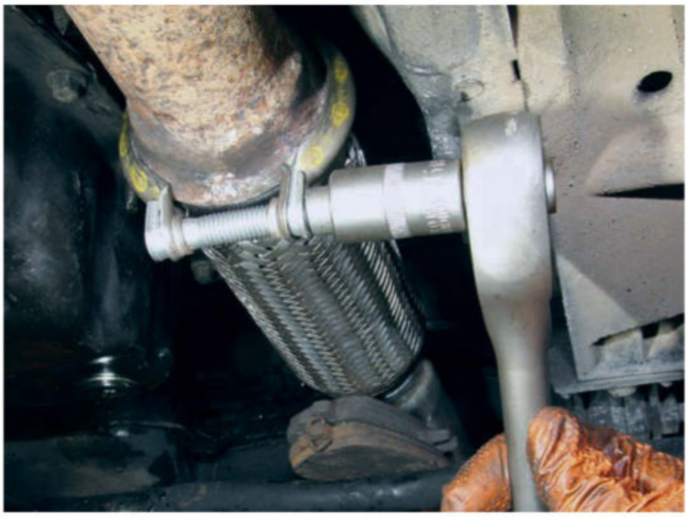
20 Suspending the new mid-section on a transmission jack, Rob realised it could be fitted in two positions, but there was only one way up that was best, with the locating pegs on the underside.



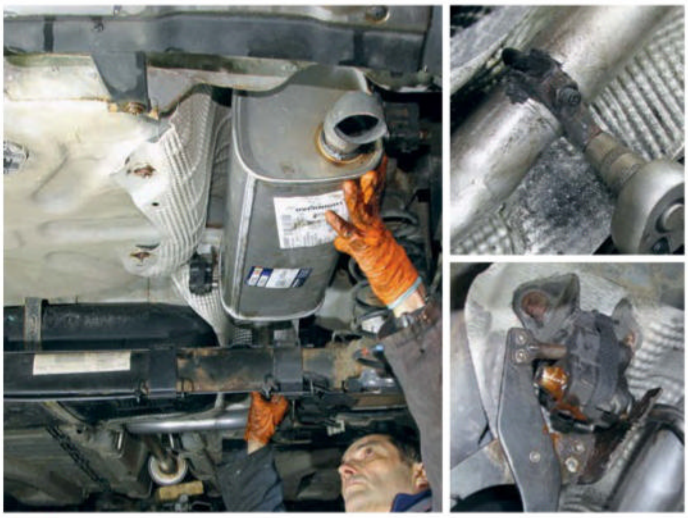
21 Spraying penetrating fluid into the rubber hangers helped to ease the steel locating pegs on the replacement mid-section through them. The flexi-section was now butted up against the end of the cat/downpipe.



22 Despite having plenty of movement in the flexi-section, its end needed to be flush with the downpipe, but it was sagging a little. A brace bar on the vehicle and some old brake pads came in useful for supporting the exhaust system.



23 The original clamp between the downpipe and flexi-section broke up, so a new one was fitted and tightened, ensuring it remained wrapped around the join.



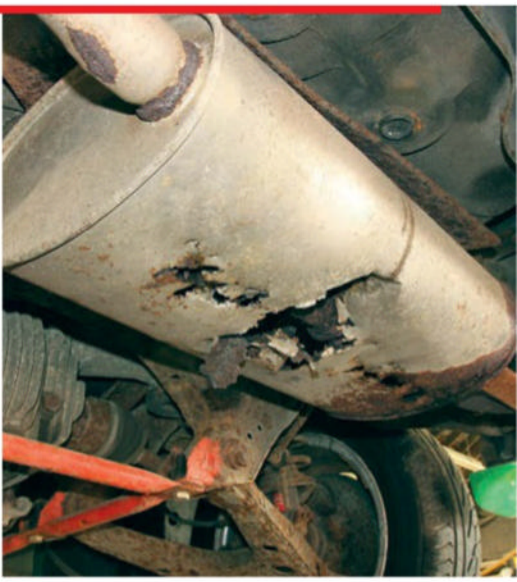
24 Next, Rob manoeuvred the rear silencer section over the back axle and into position. It joined to the mid-section easily, but before they were clamped together, the system was secured by its hangers.

25 Once the exhaust was fully suspended by its rubber hangers, the two clamps were fully tightened and Rob shook everything to make sure nothing was fouled. Next, he ran the engine and further tightened the clamps as they became warm.

THE LIFESPAN OF A BACK BOX

1 Rob Hawkins has owned his Mk2 MX-5 for over 12 years and first changed its rear silencer in 2013 when the tailpipe fell off. He completed the job on his driveway with the rear of the vehicle raised using drive-on ramps.

2 Four years later, he replaced the catalytic converter and mid-section, but the rear silencer was still in good condition, so it was refitted.



3 An impressive 12 years since replacing the rear silencer, it finally gave up this year when a small hole was spotted on the underside which, with the help of a screwdriver, was easily expanded.

⇨

THE LIFESPAN OF A BACK BOX CONTINUED

4 With the MX-5 on the ramp of Rob's local garage (MJ Motors), he undid the two mounting bolts that secured the rear silencer to the rest of the exhaust system. He'd fitted stainless steel bolts back in 2017 and found they were straightforward to undo.

5 Dan Smith at MJ Motors gave Rob his pair of modified exhaust hanger removal pliers to help detach the three rubber hangers that suspend the rear silencer section to the underside of the MX-5.

6 The frontmost rubber hanger proved to be the most awkward to detach (space was limited to fit the pliers), so Rob resorted to lowering the rear silencer and manoeuvring it off the hanger.

7 With the old silencer removed, it was compared to the new one to make sure it was the same shape and size and that all the mounting pegs were in the same positions. Everything appeared to be the same.

8 The mating face on the back of the mid-section was thoroughly cleaned to ensure a leak-free fitment with the new silencer. The remains of a gasket were found – luckily, we had a replacement to hand.

9 The mounting holes of all three rubber hangers were coated with XCP multi-purpose spray. This helps to ease the mounting pegs through them (the pegs were also coated with this lubricant).

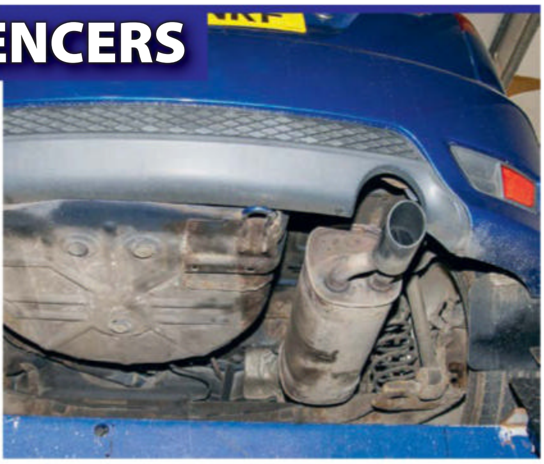
10 Confident he was ready to fit the new silencer, Rob fitted the new gasket onto the end of the mid-section and manoeuvred the silencer into position, attaching it with one of its offside hangers.

11 With three rubber hangers and a couple of nuts and bolts to secure the silencer, it was a bit of a puzzle as to the correct order of fitment. Rob managed to attach the two offside hangers and refit the nuts/bolts, leaving the nearside hanger to be levered into position.

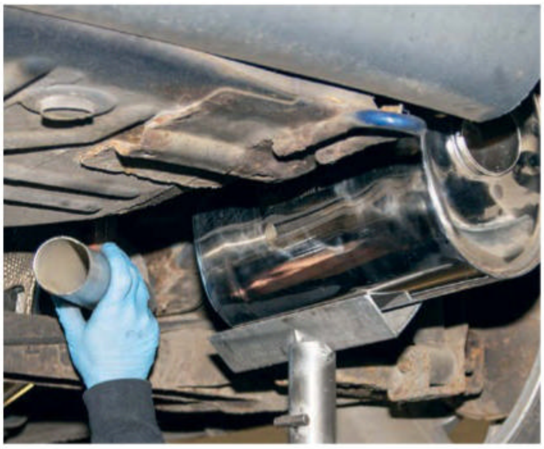
12 After progressively tightening the two nuts and bolts that secure the rear silencer to the mid-section, the engine was run to listen for leaks and left to allow the exhaust system to warm up before attempting to tighten those fastenings again.

CUSTOM-MADE SYSTEMS & SILENCERS

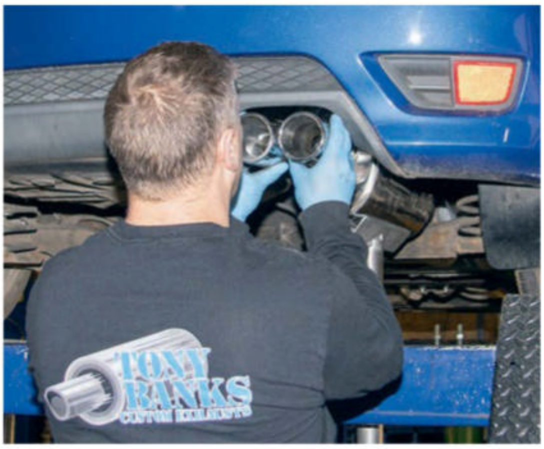
1 ◀ Exhaust specialists, such as Tony Banks, can create an exhaust system that's made to fit onto a vehicle. They have the tools to cut and bend the pipework and a TIG welder to attach it together.



2 ▶ We followed a Mk5 Ford Fiesta ST having a custom-made rear silencer fitted. With the vehicle on the ramp at Tony Banks's workshop, the old one was removed to see how much space was available.



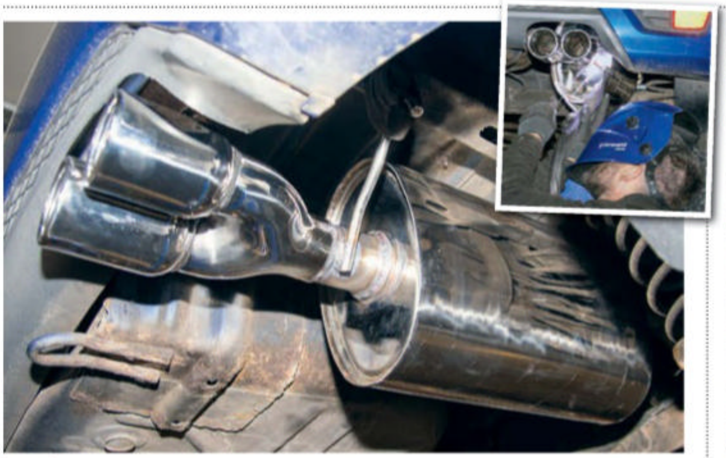
3 ◀ After choosing a stainless steel silencer from Longlife, which includes a lifetime guarantee, it was trial-fitted to see how much pipework would need to be added to connect it to the end of the mid-section.



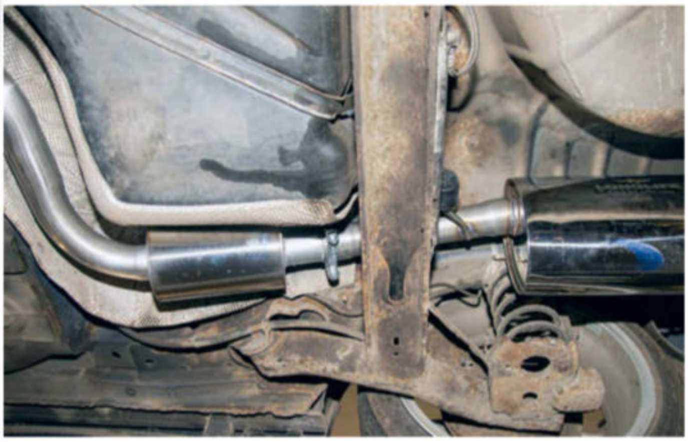
4 ▶ A choice of tailpipes is available, so the owner of this Fiesta ST, Andy Ellis, chose one and then David at Tony Banks positioned it onto the rear silencer to check it wouldn't foul the rear bumper.

5 ◀ Confident the front pipe and tailpipe could be fitted to the new silencer, both were attached with a few spots of TIG weld whilst all the parts were supported in position on the underside of the Fiesta ST.

6 ▶ Having joined them together with a few spot welds, the three parts were transferred to a workbench where they could be fully TIG-welded together. The assembly was then refitted to check it was sitting correctly.



7 The final job was to fit a couple of mounting pegs. Tony Banks has a bending and cutting machine to make the correct shape and size of peg. These were TIG-welded to the front pipe and tailpipes in situ.



8 A new exhaust clamp was fitted to secure the front pipe of the silencer to the end of the mid-section. The new custom-made rear silencer was a noticeable improvement over the standard assembly.

Your Letters

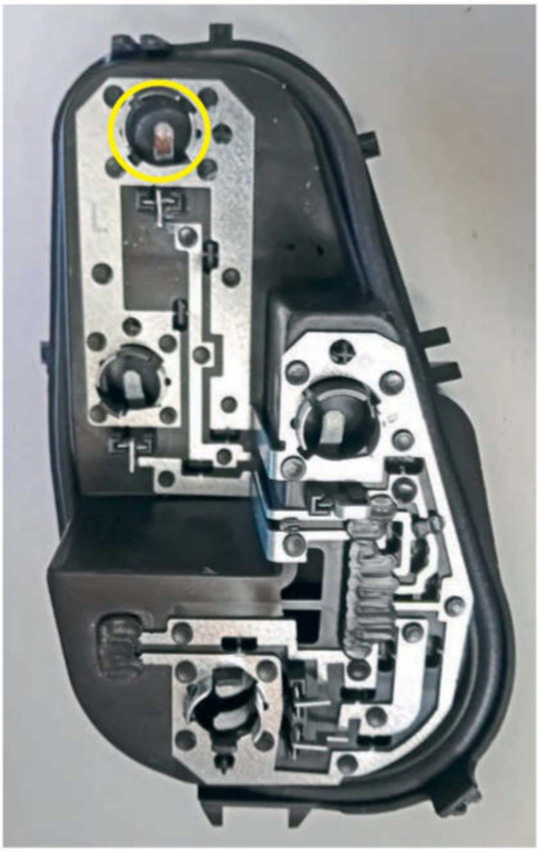
Please send your letters either by writing or sending an email...

E-MAIL to:
martyn.knowles@kelsey.co.uk

WRITE to:
Martyn Knowles,
Car Mechanics,
Kelsey Media, The Granary,
Downs Court, Yalding Hill,
Yalding, Kent ME18 6AL.

Please include a postal address with letters submitted by email.

A BROKEN BULB



▶ When I was told by my wife that the rear left brake light had failed on our 2016 Skoda Fabia I was not unduly concerned. An easy fix? Surely? On reflection, this was a first. None of the bulbs front or rear have ever needed to be changed.

My thoughts were guided to a certain extent by experience with the 60-plate Skoda Octavia. On other cars I have had – Peugeot 205, VW Passat, Vauxhall Nova and even on an Austin Maestro there was always an amount of fiddle. The 205 called for the battery to be removed to get at the headlight unit. Whoever designed the headlight unit for the Octavia must really have thought a lot about accessibility. Unwind a plastic wing nut; lift a tab and pull out a lever and the whole unit shoots forward to give full access behind rubber covers at the rear.

There is no internal access to the rear light unit on the Fabia. Two T30 screws hold the unit into the outer shut of the boot. It is best to disconnect the whole unit from the wiring loom. The bulb holder is secured to the lens unit with a series of awkward, stiff clips. Not one of the finest designs on this application.

Finding the failed bulb was easy. There was clear break across the filament. Not quite so obvious was the corrosion of the connection to the central connector. It was evident on this connector only. No amount of cleaning would restore this connector. It is possible to replace this connector only from another good unit by prising it out and re-clamping the new one onto the backing connector of the whole housing.

This is what I did, having managed not to check part numbers, and receiving the rear left bulb unit from the estate version of the car which, of course, is not the same! The unit I bought was half the price of the correct one. Caveat emptor!

Robin Morris

FITTING OF A SPACE SAVER

▶ Peter Walmsley's 'legality' letter (*CM* Feb25) about fitting a space saver spare on a car's front axle led me to Michelin's website, specifically Question 2, on its web page: **https://www.michelin.co.uk/auto/advice/choose-tyres/mixing-tyres#**

Q: Can you put tyres of different brands, treads, depths or seasons on the same axle?

A: This is generally prohibited by law.

So consider asking Michelin: "Which specific English law/s, please?"

CASE STUDY: Toyota Yaris Hybrid Owners Manual (published 2016), Toyota part number: PZ49X-K0010-EN V1, page 405 includes the following:

- Use the compact spare tire temporarily, and only in an emergency.
- Make sure to check the tire inflation pressure of the compact spare tire.
- The vehicle becomes lower when driving with the compact spare tire.
- If you have a flat front tire on a road covered with snow or ice, install the compact spare tire on one of the rear wheels of the vehicle.

And page 406 includes:

- Replace the compact spare tire with a standard tire as soon as possible. Avoid sudden acceleration, abrupt steering, sudden braking, and shifting operations that cause sudden engine braking.
- Do not drive at speeds in excess of 50mph when a compact spare tire is installed on the vehicle. The compact spare tire is not designed for driving at high speeds. Failure to observe this precaution may lead to an accident causing death or serious injury.

SUM-UP: I will not be fitting any space saver spare to any front-wheel-drive axle, especially in winter.

Don Stickland

COURSES

▶ Just in reference to Peter Simpson's column in the May 2025 issue, where he discusses his speed Awareness Course. I felt obliged to reply to thank Peter for being open-minded and giving the process a fair chance – reason being, I do Helen and John's job as a course trainer for various types of road safety course. There are a few in total, there is the speed awareness, there's also Motorway Awareness, What's Driving Us? (A general driver awareness type course) and some others too. The full list is available at **https://www.ukroed.org.uk/courses/**

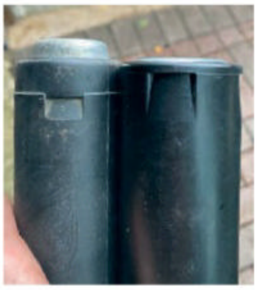
Most of us as you rightly say have never had any refresher training or have read the good old highway code book in many years. The courses are a bit of a 'dust off' and offer some food for thought in a relaxed environment. They are certainly not a telling off, and if you find yourself on one of the courses (especially mine) there is some good humour – honest!

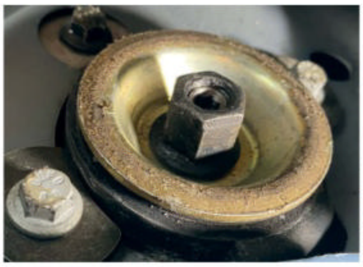
An old version of the speed awareness speed impact video that Peter mentioned, this one featuring Tiff Nedell, has been now made publicly available, and is a really good watch. It explores the effect of being slightly over the speed limit. **https://youtu.be/Ots-GeGrIDc?si=5vKw7QOkH4b_YynU**

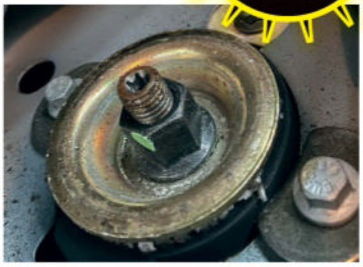
For anyone offered one I would strongly recommend you take the offer up. I can almost guarantee if you have an open mind you will come away pleasantly surprised.

Chris (Nottinghamshire)

CHECK YOUR PARTS







At my age (77), I have been dealing with factors and aftermarket parts since the 1960s. Over that time I have had very few problems with aftermarket parts up until the last few years when a large number of imported parts have become available. Photos (above middle and right) are the top rear shock absorber stud on my 2005 Volvo V70 – middle is the new part and the right image is the original showing the difference.

The image left is the comparison of the top shroud. Shown left is the original Volvo part and right the new one. The new was too large in diameter to even go into the top mount. Fortunately I managed to swap the shroud over fairly easily. I can only assume that nobody in the system bothered to check they were fit for purpose. Just goes to show you must check even with a famous name on the box.

Peter Richardson

MOTORING MEMORIES

Re Peter Simson's article 'Cars are getting older' (*CM*, Jan25) prompted me to write as it was only the previous day, I compiled a list, 'Cars we've had, their prices, etc'. I thought I would do this for nostalgic reasons as I know my children would appreciate it in years to come albeit of little interest to anyone else.

My seventeen cars in fifty-six years are nothing outstanding, possibly quite meagre even though there were periods without a car.

My first car, a 1957 Vauxhall Victor was bought for me by my then girlfriend, my late wife, in 1968 for £40. I certainly wont go through the list of seventeen, only one of which was brand new, but it has comments as to why and how we bought, including very funny and not so funny facts.

Your article mainly refers to the comparative cost of new cars but my observation (not a new one) is regarding that of used cars.

A couple of examples from my purchases. An Austin Montego 1990 (H-reg) bought at about a year old for £3.5k. Our first 'really nice' car; very plush model.

Jump to 1996, a four-year-old Citroën Xantia at £5.6 when my wife did a really good deal in getting £1k part-exchange on our Rover 216 that mechanically had seen much better days. We nicknamed her Ida Daley (ref *The Minder* TV show) as she was always good at this.

My latest and existing car is a Peugeot 508 bought nearly new from a main dealer in 2017 for £18k, which wasn't bad for a main dealer but not the cheapest around. OK, that's more than three times the cost of the Citroën but that's *circa* 21 years afterwards and it was four-year-old.

Very local to me there is a good but generally expensive repair garage/used car dealer – only sells low mileage, 1-2 previous owner cars. They have a 2016 Citroën C3 Picasso for £5k (note the £5.6k Xantia in 1996 which wasn't mechanically great otherwise it would have been even dearer).

In dire need of a car for my son and low on cash, I recently bought him a 2007 Ford Fiesta for £1200 with genuine 75k miles. Compare that to the 17-year-old Ford Cortina bought 40 years ago for £1k.

I agree with cars getting older. They are also safer and as your article points out, don't rot like most of my old purchases but technological advances beyond the scope of non-*CM* readers and enthusiasts has led to some amazingly good cars in most respects being thrown on the scrapheap because repair of body or engine is not affordable/cost-effective.

The car prior to my present one was an immaculate Peugeot 407 – top spec, 11-years-old, had for nine, longest owned car to date. 120k but purred like a kitten. Thought best 'get rid' because not Euro 6. I eventually had to sell for £650 on eBay as there was no interest, not even part-exchange.

I think the Eolys fluid replacement may have been its final demise as it wasn't owned by anyone long after. That and simpler defects or maintenance requirements is all that needed for an otherwise perfectly good car.

Tony Restarick

BEST ADVICE

Longer ago than I can remember, a fitter I was working with told me that if a nut or bolt would not come undone, try tightening it up. I did think it odd but it worked then and has for me since, several times. I suppose it just "breaks" the friction hold.

Also, regarding impact drivers: never use a non-impact socket. I did once, just to speed run up a longish thread and only "clicked" once but it cracked the socket. I didn't notice until I came to use it later.

George Fawcett

AN AMBASSADOR

Having now reached the age of 61, the Princess story in the April 2025 issue brought back a memory of when I started working in a BL parts department as a 17-year-old lad in Co. Galway, Ireland. Our garage manager had a brand-new silver top-of-the-range Austin Ambassador at that time, and he asked me to attend a parts conference in Dublin, as the senior partsman was on holiday in the USA.

At that time there was no motorway from Galway to Dublin, so that journey could take three to four hours. Imagine my delight when he gave me his new Ambassador (with expenses) to make the journey. I was like the cat who got the cream.

Declan Kelly

STAR LETTER

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GORILLA WIPES

Reading *CM* May 2025, I noticed on page 26 you are praising these Gorilla wipes. I also use them for work, general cleaning duties and find them very good.

GORILLA WIPES
ANTIBACTERIAL

One tip if they do start to dry out give the whole tub a good shake (with the lid on). The moisture in the wipes drains out of them and settles in the bottom. Shaking the tub puts the liquid back in the wipes. Works with all brands of wipes. I now give the tub a little shake each time I use them.

Got a tub in the garage been opened for three years, wipes are still wet.

Nick Lett

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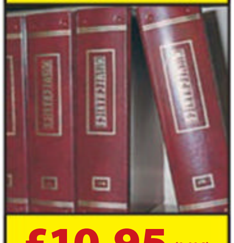

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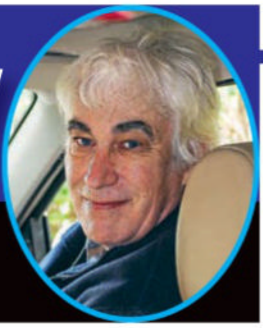
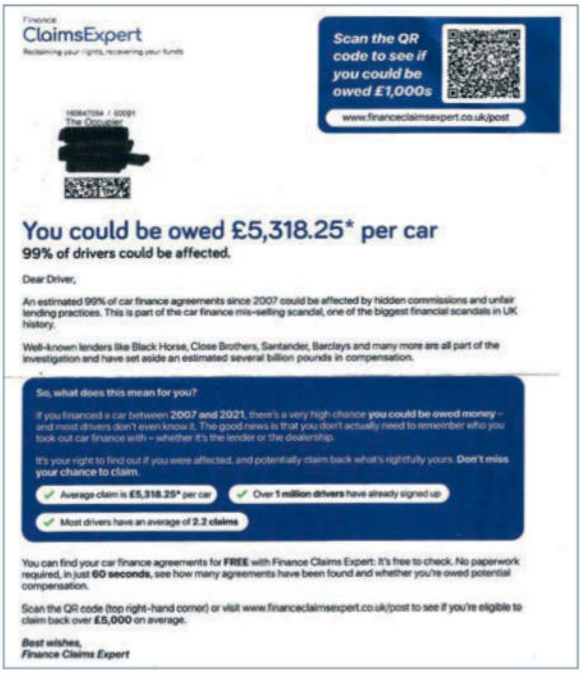


Peter Simpson provides us with an insight into the automotive sales trading world – and beyond.

It's started

▶ As I mentioned last time (and have reported on 'once or twice' previously), the Close Brothers appeal against last year's court of appeal decision regarding commission payments to dealers not being disclosed has now been heard by the Supreme Court. A final decision is not expected until the summer, but the 'claims management' industry seems certain that motorists will be able to claim substantial sums in compensation. Widespread advertising campaigns, on paper and online, advising people that they are likely to be entitled to at least £1000 (and quite possibly £4000+) for every car finance deal they have taken out since 2007 are now appearing. They are also using blanket mailshots – I received the attached, addressed as you can see to 'the occupier' a couple of weeks ago.

The online versions are on high-visibility sights such as YouTube, and are jam-packed full of trigger-phrases such as "breaking news", "car finance so high and difficult to pay off", "new evidence", "inflated interest rates", "bonuses and extra profits for the dealers", "truth slowly leaking out", "predatory lending", '"supreme court expected to force lenders", "refund affected drivers", "thousands back", "hard-earned money", "act now to avoid disappointment", "millions of claims" and so on.



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The Occupier
[redacted]

You could be owed £5,318.25* per car

99% of drivers could be affected.

Dear Driver,

An estimated 99% of car finance agreements since 2007 could be affected by hidden commissions and unfair lending practices. This is part of the car finance mis-selling scandal, one of the biggest financial scandals in UK history.

Well-known lenders like Black Horse, Close Brothers, Santander, Barclays and many more are all part of the investigation and have set aside an estimated several billion pounds in compensation.

So, what does this mean for you?

If you financed a car between **2007 and 2021**, there's a very high chance **you could be owed money** – and most drivers don't even know it. The good news is that you don't actually need to remember who you took out car finance with – whether it's the lender or the dealership.

It's your right to find out if you were affected, and potentially claim back what's rightfully yours. **Don't miss your chance to claim.**

- ✓ Average claim is **£5,318.25*** per car
- ✓ Over **1 million drivers** have already signed up
- ✓ Most drivers have an average of **2.2 claims**

You can find your car finance agreements for **FREE** with Finance Claims Expert: It's free to check. No paperwork required, in just **60 seconds**, see how many agreements have been found and whether you're owed potential compensation.

Scan the QR code (top right-hand corner) or visit www.financeclaimsexpert.co.uk/post to see if you're eligible to claim back over **£5,000** on average.

Best wishes,
Finance Claims Expert

As always however, you need to read the small print to get the full picture. The 'system' works by the website first identifying whether you have a potentially valid claim by searching various lenders databases. This stage is free. Though the information you get is readily available elsewhere, I fully accept fully that doing it this way is probably a lot easier than searching individual sites.

The downside, however, is that once they have your contact details, these firms are likely to contact you regularly (and by 'regularly', I mean quite possibly daily) to try and sell you their services. This is, I stress, 100% legal and a far from unusual sales tactic.

However, these firms do not generally claim the compensation themselves. Rather, once they have established that you may have a claim, they pass your details to specialist solicitors in return for a referral fee. Said solicitors then pursue your case on a 'no win no fee' basis. The fees, however, can be massive; the small print quotes a range of up to 30% of the compensation awarded. My experience is that it will rarely be much less than this and can be higher. Then with VAT on top, you're at 36%. Yes, that's more than a third of the amount you receive!

Many will no doubt take the view that because this is money they weren't expecting anyway, they are quite happy to let someone else handle the whole thing. Even if this means that instead of the quoted £1000 minimum compensation per finance deal, they finish up with only £640.

However, there is absolutely no obligation to use one of these services to make your claim. You can do it yourself and keep 100% of any compensation you have been offered. As usual in cases like this, 'money-saving expert' Martin Lewis has on his website, everything you need to make the claim yourself. Go to **https://www.moneysavingexpert.com/reclaim/reclaim-car-finance**

With finance agreement going back to April 2007 being eligible, this is, potentially, going to be massive!

Managing expectations

▶ Like them or loathe them (there doesn't seem to be much middle-ground), Electric Vehicles have moved on significantly in recent years. This is especially so when it comes to operating range; the average official range of EV cars in the UK is now around 236 miles. Some of course do much better than this – some Teslas for example can manage up to 436 miles on a single charge, though 300-320 is a more realistic real-world figure. And if we're looking at more affordable car, the MG5 EV (the one that looks rather like an older VW Passat and now under £9k if you don't mind it being a bit up on miles) should top 250 miles between charges.

All this is something of a far cry from the first mass-market EVs to be sold here – the Nissan LEAF and Renault Zoe. When launched in 2013, the Zoe and LEAF had 22kWh batteries. For these, the manufacturers quoted a real-world range of 62-93 miles – the 2015-on 40kWh version was better of course with 120-140 miles more typical. And bear in mind that because EVs DO drive differently to conventional cars, a new driver is unlikely to achieve maximum range until they've become used to the car.

With early LEAFs and Zoes now being available for under £3000, they are now affordable to many who may not have previously considered an EV. However, I have heard of a few cases where new-to-EV buyers have been very disappointed by the range available – they read about the aforementioned 300-mile plus ranges but found that the car they've bought needs plugging in after 60 miles.

Realistically, until the charging network has developed significantly, an early LEAF or Zoe is probably an around-town car only. And it really is best for everyone if a potential buyer is aware of this before buying rather than after.

BCA acquire Aston Barclay

▶ The day after last month's magazine went to press, news came through that Constellation Automotive Group (owners of British Car Auctions, webuyanycar.com, Cinch and Marshall Motor Group), had added another two businesses to their expanding motor trade portfolio, with the acquisition, for an "undisclosed sum" of the Aston Barclay car auction group, along with their subsidiary the Car Buying Group. Industry sources suggest that Aston Barclay has had a "difficult" recent history, and in January, they closed their Leeds remarketing centre.

In a press statement, Constellation Automotive said that, "Aston Barclay has recently been experiencing difficult market conditions – the acquisition aims to secure the longer-term viability of the Aston Barclay network of centres and avoid further closures by bringing further investment into the business, along with incremental volume from the Group's growing WeBuyAnyCar business.

The Aston Barclay auction network comprises five sites, located at Chelmsford, Prees Heath (Shropshire) and Westbury in Wiltshire, plus two 'mega sites' at Donington Park and Wakefield. Originally privately-owned, Aston Barclay was the subject of a management buyout in 2017. The following year it bought the Car Buying Group, but in 2023 the Chelmsford, Westbury, Prees Heath and Leeds sites, which until this point were owned freehold, were sold and leased-back on long-term leases.

At the time of writing, no information has been released on how far Constellation Automotive plan to integrate Aston Barclay's auctions and the Car Buying Group into their existing network, other than that some webuyandcar.com stock is to go through Aston Barclay auctions.

At present, the businesses seem to still be totally separate, retaining their own branding. In the case of Car Buying Group and webuyanycar.com, the valuation procedures also appear to be separate – entering the same details for my Volvo C70 on both sites gave a valuation of £2062 from Car Buying Group and £2110 from webuyanycar.com. Both these are, of course, pretty derisory, but the point is that they aren't the same.

The big question for most in the trade though is whether the Aston Barclay auctions will continue with their present policy of physical auctions with the option of online bidding, or switch to BCA's online-only model. Sadly, I can't tell you, because they are remaining fairly tight-lipped about it.

This may well be because they haven't decided which way they're going...

Volvo XC90 struts

▶ Came across a slightly odd case the other day which, if nothing else, provides clear evidence of just how complex modern cars are, and just how integrated the various systems are. The vehicle in question was a Volvo XC90. I'm not sure of the exact age but I think it was around about 2014.

The car in question has a power-operated tailgate. Customer bought it nine months ago and all was well until they took it to a Volvo dealer for a software update. However, the dealer said that they could not carry this out, because "the power tailgate struts are from the incorrect model year."

The customer – who, remember has at this point owned the car for nine months – then kicked off big-time: "Why have you supplied us a car with the incorrect boot struts? Has it been involved in a rear-end accident? We want it sorted or will be speaking to Trading Standards."

In truth, tailgate struts have been a Volvo weak-spot for years; right back to the lego-brick 240 range in fact. The difference, though, is that these cars have become more complex, so the price of genuine replacements has sky-rocketed. For an XC90 of this age, even with trade discount, they're £700 – or £840 if you can't reclaim the VAT. So unsurprisingly, most people with a car of this age (which is most likely now worth under £9k) look to buy aftermarket struts costing £100-£150 (or less) even if that means losing the power-operation system.

However, as this case shows, Volvo software will show this has been done, though I find it hard to believe that a software update to a completely different part of the car can't be completed because the car has non-factory tailgate struts.

In fact, the cynical side of me wonders whether what has actually happened here is that the car was sold without an auto-opening function, but the guy has discovered that it originally had it, asked a Volvo dealer to recommission it, and is now trying to get the dealer to make it work!

How this one will play out I've no idea. If I ever get to hear the final outcome I'll let you know. What I do know though is that had I sold this car without a working power-tailgate, and I hadn't advertised or sold it as having one, there's no way I'd be providing it nine months later!

Ian Cushway searches out **new** and **used** parts prices

Merc B-Class

Having flown under the radar, the underrated second-generation B-Class is practical, packed with features and now affordable.

Think compact MPVs and mainstream offerings like the Ford C-MAX come to mind. However, now that prices have softened, there's another family car contender worthy of consideration – the second-generation B-Class. It's posh, packed with features, usefully roomy inside and comes with an array of safety features.

The W246 model broke cover here in late 2011, the range featuring the B180 and B200 BlueEfficiency 1.6-litre petrol models and 1.8-litre turbodiesel offerings in the guise of the B180 and B200 CDi. The four-wheel-drive 2.0-litre B220 CDi 4Matic joined the party in early 2014 and came with a seven-speed dual-clutch automatic transmission (DCT) as standard. The fuel-sipping 1.5 B180 CDi Eco SE joined the range at about the same time.

The B-Class was equipped with a six-speed manual transmission as standard, with the DCT offered as an option, the latter being a popular choice with city centre dwellers more accustomed to traffic-clogged stop-start driving.

As you would expect, spec was generous with the SE getting 16in alloys, heated electric door mirrors and aircon as well as automatic headlights and wipers. They even had a device to help assist when parking. The Sport (which became the AMG-Line later in life) got 18in alloys, sat 15mm closer to the tarmac and featured privacy glass, LED tail lights, a handy reversing camera and bi-xenon headlamps. Meanwhile, the range-topping Executive added leather, heated front seats and sporty black headlining.

A clever B-Class feature was the fact the rear seats could slide, enabling owners to either add legroom or bootspace as the situation demanded. Moreover, the height adjustable floor meant you could hide valuables out of sight. Meanwhile, the bootspace ran to 488-litres with the seats in their upright position and a very generous 1545-litres with them folded flat, capacities that just trump the Ford C-MAX.

There was a facelift in November 2014 which featured a redesigned front end, the option of LED headlights, a bigger infotainment screen inside and enhanced safety equipment. There was a change to the engine line-up too at this point, with all diesel models featuring a 2143cc lump. Oh, and there was a battery driven model available from February 2015 with a 142-mile range, but it was expensive and is seldom seen in the classifieds.

This era B-Class, like its predecessor,

B200
CDI
KR64 RMX

What model?

▶ The petrol and diesel versions of the B180 are more abundant in the classifieds than the B200 and while the 1.5 can feel a little lack-lustre, these should suit most needs. For those doing fewer than 10,000 miles annually who don't want the worry of DPF clogging and other diesel related issues, we'd recommend the petrol, and if you can find one, hold out for the B200 if you can. Spec-wise, the Sport looks less frumpy than the SE so as long as you can live with the firm ride, that would always be our preference.

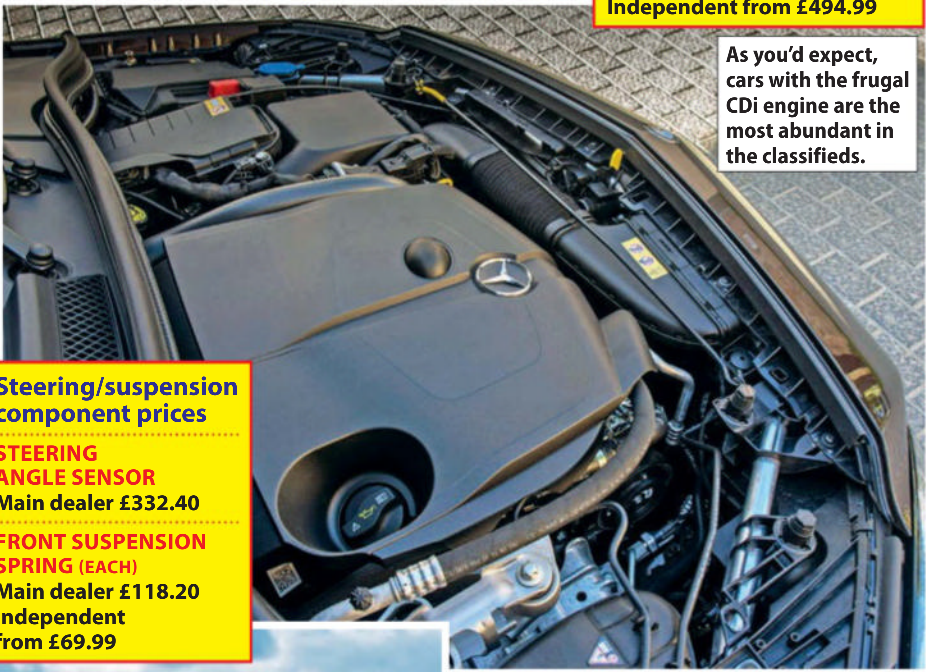
Engine component prices

OIL FILTER
Main dealer £10.20
Independent from £7.19

DIESEL PARTICULATE FILTER
Main dealer £223.20
Independent from £814.99

DUAL MASS FLYWHEEL
Main dealer £664.80
Independent from £494.99

tended to fly under the radar of most family car buyers when new – mostly because of its premium price – but over a decade on from launch, now that prices have dipped below £3000, it's become something of a hidden gem.



As you'd expect, cars with the frugal CDi engine are the most abundant in the classifieds.

Engines

Servicing should be carried out annually or every 15,500 miles; all the engines are chain-driven, so there's no need to worry about cambelt change intervals.

Reliability is first rate, although all the usual caveats apply when looking at high-mileage examples – namely glowing DPF warning lights on diesels and rattly Dual Mass Flywheels on leggy manual cars.

There's no real common issues, though there have been reports of the Stop-Start system developing issues, particularly when fuel is low or the battery is nearing the end of its life, but these are easily remedied and anecdotally, most owners disable the fuel-saving function anyway.

Steering/suspension component prices

STEERING ANGLE SENSOR
Main dealer £332.40

FRONT SUSPENSION SPRING (EACH)
Main dealer £118.20
Independent from £69.99

The only other niggle worth mentioning is failed thermostats on petrol models. Here it's a case of checking the temperature gauge on a test drive; if it's reading low after a decent drive, it's probably shot.

The DCT has received mixed reviews; some love it, others moan about its jerkiness so try it and make your own mind up. A software update can sometimes improve matters.

Steering/suspension

Being a family wagon, the B-Class is likely to have spent much of its time trudging along potholed town centre streets so listen out for knocks and rattles from the suspension. Wear in the lower balljoint bushes can be a real issue.

Errors with the steering angle sensor are also common; it's part of the clock spring assembly in the steering wheel so a replacement will be necessary. It's a reasonably easy an inexpensive fix.

Both front and rear suspension springs have also been known to snap, so check these if you can.

0 km/h
16:26
913.7 miles
3243
17.5 °C
R
N P
D
E
mph

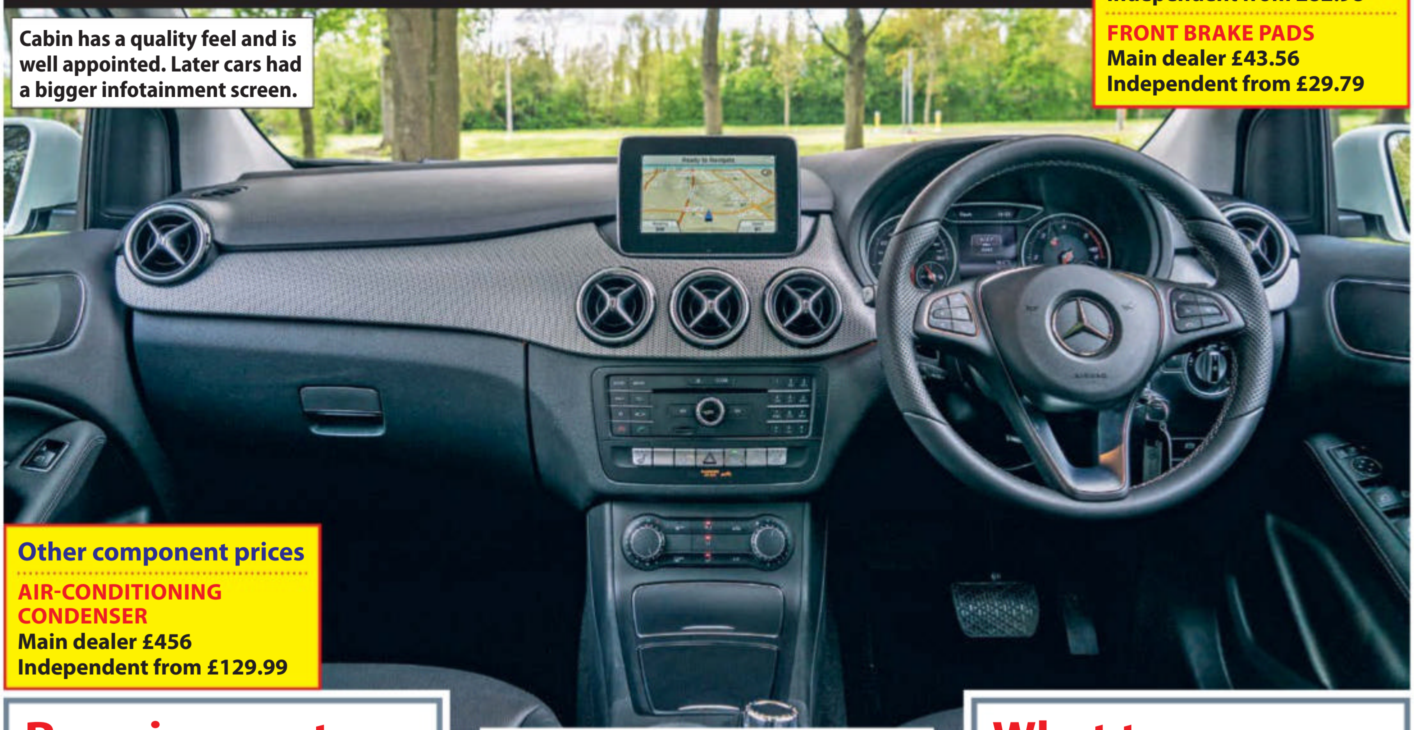
The smallest 1.5 diesel can return an impressive 70mpg on a run.

⇨

Brake component prices

FRONT BRAKE DISCS (PAIR)
Main dealer £105.60
Independent from £82.98

FRONT BRAKE PADS
Main dealer £43.56
Independent from £29.79



Cabin has a quality feel and is well appointed. Later cars had a bigger infotainment screen.

Other component prices

AIR-CONDITIONING CONDENSER
Main dealer £456
Independent from £129.99

Running costs

▶ As you'll see from our spec chart, none of the cars in the B-Class range exactly guzzle fuel – and driven with a feather right foot 60-70mpg is entirely feasible with the smaller engine diesel models. Insurance ratings go from Group 15 for the 107bhp B200 diesel through to Group 19/20 for the rapid B200 models. Annual VED ranges from £20 for the 1.5 diesel to between £165-£195 for the other models.

Boot is large enough at 488-litres. Twin level floor means valuable items can be stored out of sight from prying eyes.

USEFUL CONTACTS

Bilstein bilstein.com/en

Mercedes-Benz of Stevenage
01438 737800
www.mercedes-benzofstevenage.co.uk

Brakes

As on other Mercedes models, there's an electronic parking brake on the B-Class and this has been known to stick so check that the rear caliper on one side isn't noticeably hotter than the other.

Other than that, there's no real issues to report – so check there's no warning lights and the car pulls up in a straight line on a test drive.

As you'll see from our price comparison (top right), even brake parts from a Mercedes main dealer aren't expensive.

What to pay

▶ Given their abundance, diesel B180s will be the least expensive B you can buy, with prices kicking off at a measly **£3000** today. You'll pay a tad more for a petrol, more still if it's an auto. You'll pay a chunk more for our target car, a petrol B200 Sport though. The cheapest we spotted that fitted the bill was a 2013 with 82,000 miles on the clock being advertised privately for **£5750**. If you like the look of the post-2014 facelift model, you'll pay somewhere in the region of £10,000-£12,000 for the same car.

Other issues

You've probably gathered by now that the W246 is a supremely reliable bit of kit so we're splitting hairs when we mention the fact that some owners have complained of rattly trim. It's unlikely to affect every car and while annoying and difficult to pin-point, it's not something that should put you off buying one.

Talking of difficult to diagnose issues, be sure to check the aircon's blowing out cold air not warm on a test-drive. Our first thought would be a holed condenser, but a proper inspection is required.

Verdict

▶ More a premium family hatch than a traditional MPV but with bags of useable space inside, what's not to like about the B-Class? Especially as it's better to drive and so much better kitted out than its predecessor. For the dynamic young family wanting an alternative to its duller MPV rivals, it's a no brainer now that prices have become more affordable.

Mercedes-Benz B-Class 2011-2019

Model	B180	B180	B200	B180 CDi	B200 CDi	B200 CDi
Engine (cc)	1461	1595	1595	1796	1796	2143
Power (bhp)	107	120	153	107	134	134
0-60mph (secs)	11.2	10.1	7.9	10.6	9.2	9.6
Top speed (mph)	118	118	137	118	130	130
Average fuel (mpg)	68	47	49	64	64	65

9120

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2006 PEUGEOT 206 CC 1.6-LITRE

TOPLESS 206

Rob Hawkins follows the servicing of a 19-year-old sporty-looking Peugeot 206 CC.

Overall difficulty rating

ESSENTIAL EQUIPMENT

- 8mm square bit (for oil drain plug)
- 27mm socket (for oil filter)

Peugeot's 206 coupe cabriolet was produced between 2001 and 2007, competing with the likes of Ford's StreetKa and Vauxhall's topless Tigra Roadster, although arguably the Peugeot had the edge with its solid retractable roof.

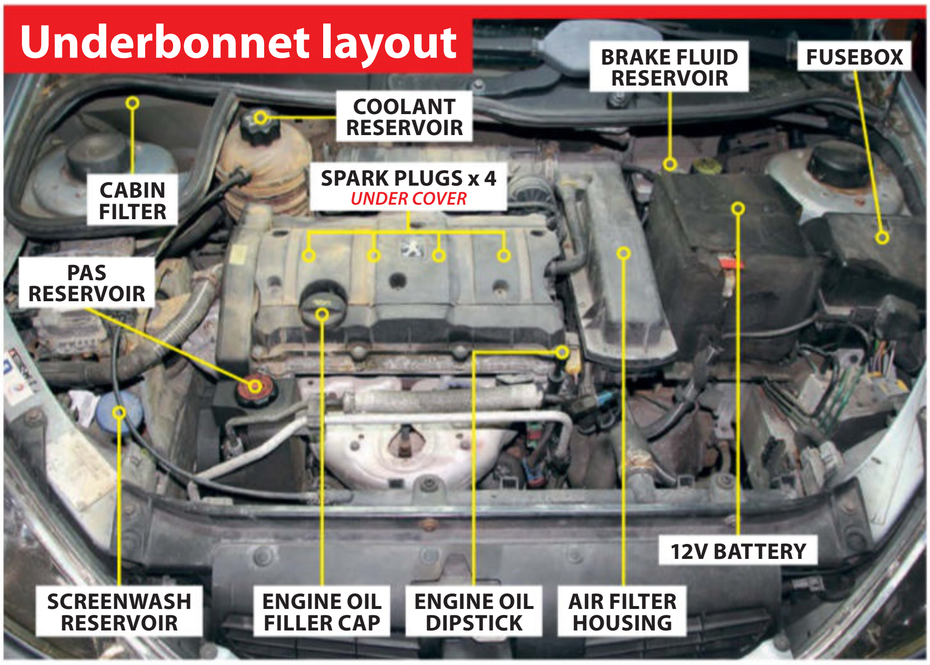
We had the opportunity to follow the servicing of a 2006 model at AES near York, which had a 1587cc four-cylinder petrol engine under the bonnet that was mated to a five-speed manual, filled-for-life gearbox. Typical of many FWD vehicles, there's a beam axle at the rear which, in this case, can suffer from worn bearings, resulting in the rear wheels and tyres scuffing the inside arches. If wear is excessive, then it may be more than simply replacing the bearings – a reconditioned axle may be required, which costs around £200.

Just as potentially problematic, especially for vehicles that are around 20 years old, is the recommended service intervals, with oil changes at every two years or 20,000 miles, and the air filter and spark plugs every 40,000 miles. For a vehicle of this age that probably isn't used as daily transport, these jobs can easily get missed.

Rob says

If the roof on the 206 CC won't open, then look inside the boot to make sure the retractable cover is fully extended and sitting in its mounting points. Mark Shipman says that the nearside mounting point has a microswitch, which prevents the roof from opening if the boot cover isn't fitted into it.

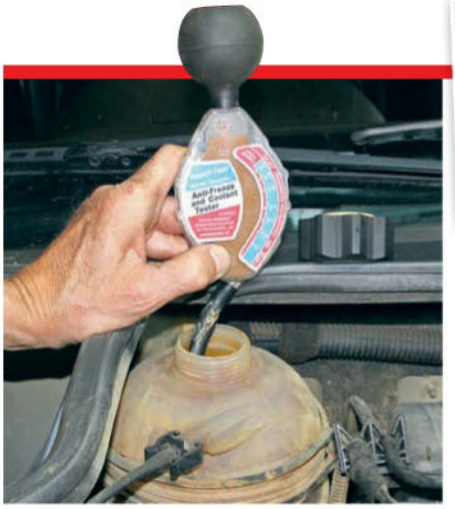
Underbonnet layout



ENGINE BAY CHECKS

1 CHECK COOLANT LEVEL

Shine a torch on the side of the coolant reservoir in the offside rear of the engine bay. The level should be close to the MAX marker on the side. If you can't see the level, providing the engine is cold, unscrew the cap and look inside.

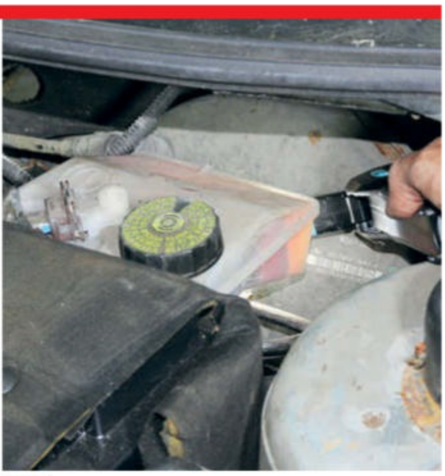


2 TEST COOLANT

The engine coolant should be replaced every 80,000 miles, regardless of time, but we also recommend testing its cooling and freezing capacity with a hydrometer. If the coolant needs changing, the system holds 5.5 litres. There's a bleed screw at the back of the engine bay.

3 SQUEEZE HOSES

Providing the engine is cold, squeeze the rubber coolant hoses attached to the top and bottom edges of the radiator. Make sure the hose clips are securely fitted and the rubber has not perished.

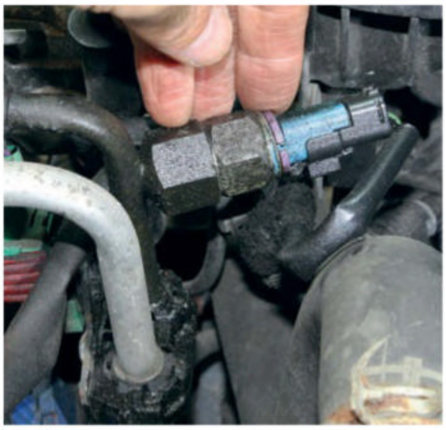


4 CHECK BRAKE FLUID

The brake fluid reservoir is on the nearside of the engine bulkhead. Shine a torch on the side of it to check the level against a MAX marker. If you can't see the level, wipe around the cap before undoing it and looking inside.

5 CHECK PAS FLUID

The power steering fluid reservoir is in the offside front corner of the engine bay. There's a dipstick on the underside of its screw cap, so extract and wipe it clean before dipping and checking the level. Top up with Dexron II.



6 LOOK FOR PAS LEAKS

Look for leaks and misting around this power steering pressure sensor. If it's present, Mark Shipman at AES says that in most cases, it will have failed and should be renewed. He also recommends disconnecting the plug and looking inside for fluid contamination.

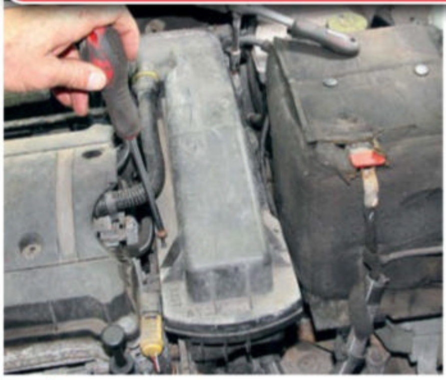
7 INSPECT FUSEBOX

There's a fusebox in the nearside front corner of the engine bay. Carefully release its plastic lid and lift it away to expose some fuses and connector plugs. Look for water ingress and corrosion. Make sure the wiring to it is concealed in plastic conduit.

8 CHECK DRIVE BELT

A single auxiliary drive belt is fitted to the front of the engine (offside area of the engine bay) and can be best inspected from below. Look for cracks across the ribs and fraying along the edges. It should be replaced with the timing belt every 10 years or 80,000 miles.

FILTERS & SPARK PLUGS



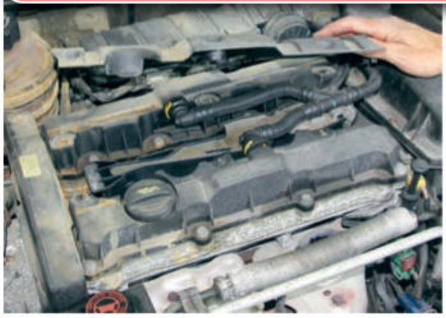
9 UNDO LID

The air filter is contained in a black plastic housing next to the back of the engine (over the gearbox). The entire housing can be removed by detaching the pipework to and from it and undoing a 10mm bolt, but it's just as awkward to undo six crosshead screws for the lid – two of them are tight to access.

10 REPLACE AIR FILTER

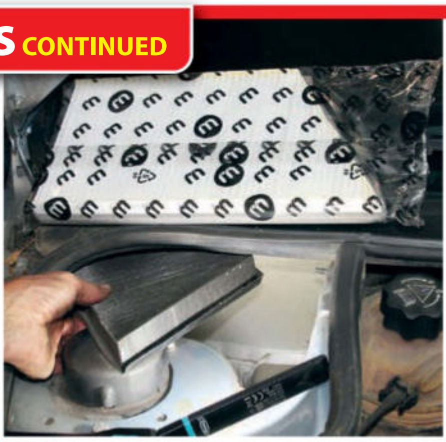
Whichever method you choose for accessing the air filter, clean inside the housing before fitting the new one and make sure the new air filter is the same shape and size as the old one. Ensure the lid fits flush with the housing to prevent any air leaks.

FILTERS & SPARK PLUGS CONTINUED



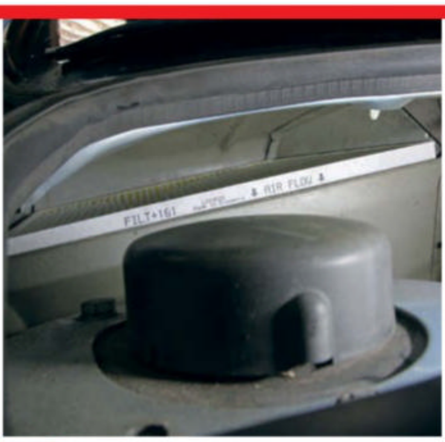
11 FIND THE SPARK PLUGS

The spark plugs should be replaced every 40,000 miles. To access them, undo six Torx T20 screws for the cover shown here. Next, undo three Torx T30 screws for the coil pack assembly and carefully extract it to reveal the spark plugs. Remove one at a time, fitting the new one and tightening it to 18Nm.



12 EXTRACT THE CABIN FILTER

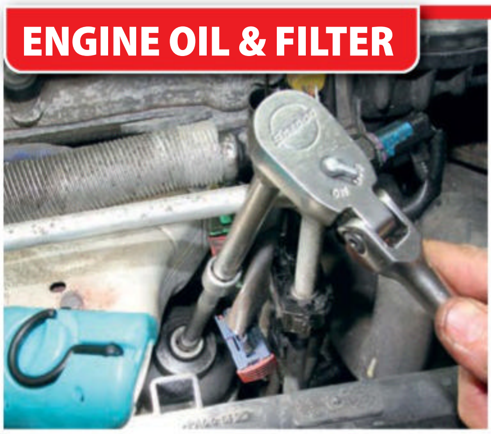
The cabin filter is tucked inside the top of a plenum in the nearside rear corner of the engine bay. Carefully lift out the old one, which may seem stuck in position. Note its shape and where the triangle-shaped side is fitted.



13 CHECK AIRFLOW ARROWS

After extracting the old cabin filter, remove any dirt and debris from inside this area before fitting the new one. Make sure any airflow arrows on the edge of the new cabin filter are pointing downwards, as shown here.

ENGINE OIL & FILTER

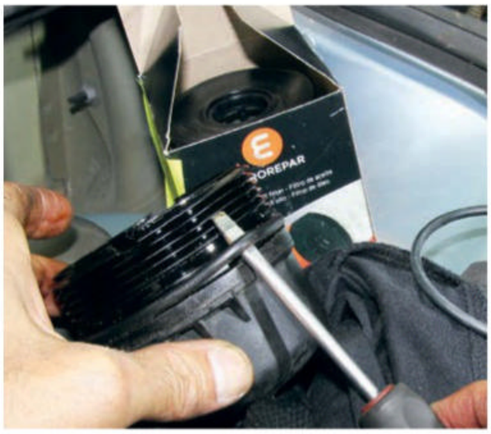


14 UNSCREW OIL FILTER

Remove the oil filler cap and extract the dipstick to help with draining the oil. Next, use a 27mm socket, extension bars and a ratchet to undo the oil filter housing, accessed from the front of the engine bay.

15 REMOVE OIL FILTER

It helps to remove the oil filter before draining the oil from the sump, but it can be a messy part of the job, especially when it comes to lifting out the old filter housing. Have a large rag close by to catch any oil that drips out.

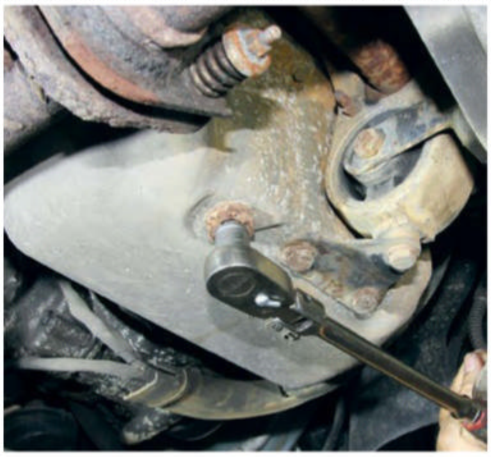


16 CHANGE SEAL

Use a small screwdriver to prise off the old seal around the thread of the oil filter housing, then fit a new one in the same position and add a smear of fresh engine oil around it. This will help to reduce the risk of the new seal dragging and tearing when refitting and tightening the housing.

17 REPLACE FILTER

Extract the old oil filter, check the new one is the same shape and size as the old one, then fit it into the housing and make sure it clicks into position. The new filter shown here could be fitted either way round into the housing.



18 UNDO DRAIN PLUG

Before refitting the oil filter housing, drain the engine oil from the sump. Position a drain bowl underneath it, then use an 8mm square bit to undo the sump plug. If you don't have such a tool, then a large socket can be used instead, although the flats on the drain plug are quite shallow, so the socket can slip.

19 DRAIN OIL

Once the drain plug has been extracted, leave the oil to drain for several minutes. Having removed the oil filter housing, dipstick and oil filler cap, this will help with draining the engine oil because it improves airflow.

20 REPLACE WASHER

Whilst the engine oil is draining, remove the old Dowty washer from around the sump plug and fit a new one. This type of washer has a rubber seal around the inside of it. In our case, the old washer shown here was made of steel. Refit the sump plug with its new washer, tightening it to 30Nm.

21 REFIT FILTER HOUSING

Return to the top of the engine bay and refit the oil filter housing with its new filter and seal, tightening it to 25Nm. Wipe around the housing to make it easier to look for oil leaks after running the engine.

22 REFILL ENGINE OIL

Measure three litres of PSA-classification fully-synthetic engine oil (we used 5W-30, but other grades are recommended, depending on climate) into a clean jug, then carefully pour this into the engine via the filler cap.

23 RUN & CHECK

Extract the dipstick, clean and reinsert it to check the oil level, topping up if required. Run the engine and check for leaks, making sure no engine oil warnings are displayed on the dashboard. Switch off and check the oil level again, topping up if necessary.

BRAKE CHECKS

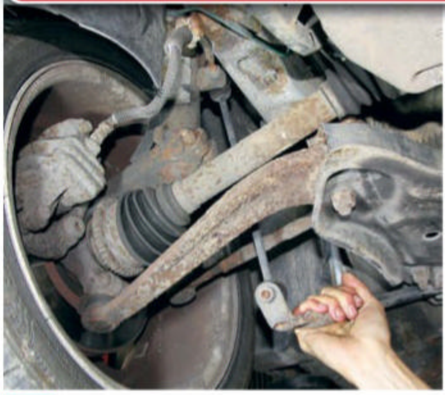
24 MEASURE BRAKE PAD DEPTH

There's room to manoeuvre a pad thickness gauge through the spokes of the front wheels and behind them to measure the depth of the pads' friction material. At the rear, it's easier to measure everything from behind the road wheel. If you are unsure, remove the road wheel. The minimum recommended depth is 2mm.

25 MEASURE DISC THICKNESS

The brake discs are easier to measure from behind the road wheels (or remove them). On the front, the minimum thickness is 11mm for solid discs, or 20mm for vented discs with ABS (18.4mm without ABS). On the rear, solid discs should be more than 6mm thick.

SUSPENSION & UNDERSIDE CHECKS



26 WIGGLE ARB DROPLINKS

There's an anti-roll bar (ARB) at the front, so check the condition of its mounting bushes to ensure they haven't perished. Wiggle each droplink to check for excessive movement, which could cause a knocking noise when driving.

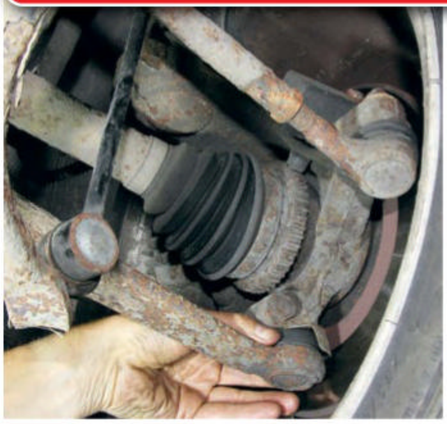
27 CHECK FRONT COILS

The front coil springs can be visually inspected over the tops of the tyres. Look for fractures and excessive corrosion, but do not touch the springs in case you trap your fingers. Brush away any dirt caught around the base of each spring.

28 SQUEEZE BOOTS

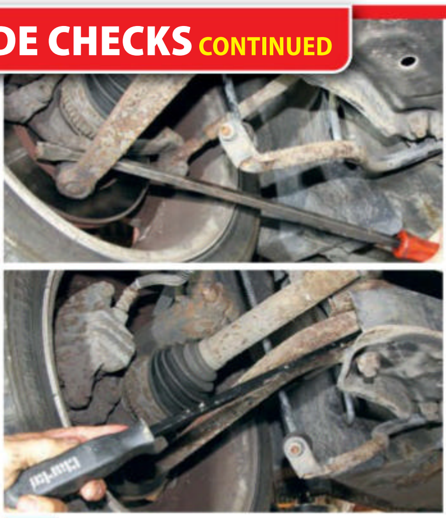
The driveshafts between the gearbox and front hubs have corrugated rubber gaiters over the CV joints. Squeeze these gaiters to look for cracks in the rubber, escaping grease and water ingress, which may result in premature wear.

SUSPENSION & UNDERSIDE CHECKS CONTINUED



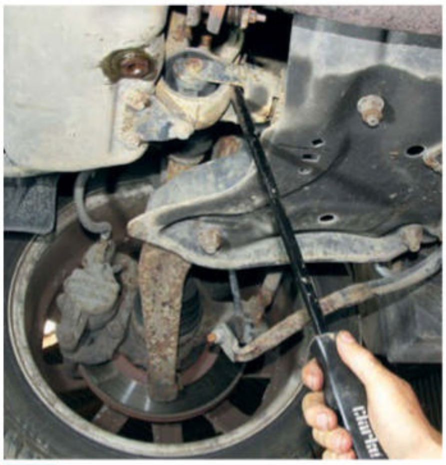
29 TRE & BALLJOINT COVERS

Look for the dust covers around the balljoints for the steering track rod ends (TREs) and the front lower suspension arms. Pinch them to check for splits and escaping grease. If there are cracks in the rubber, water and dirt could get in, leading to premature wear.



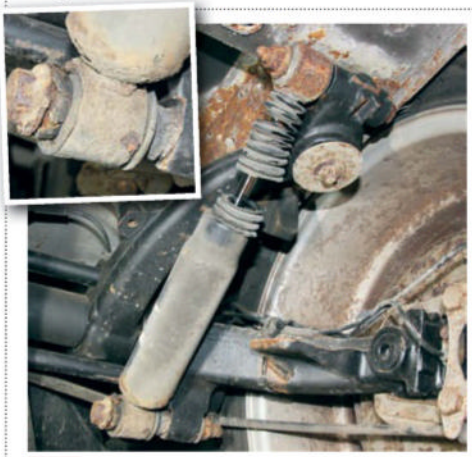
30 CHECK LOWER ARM BUSHES

Lever a pry bar against the inner mounting point for each front lower suspension arm to check for excessive movement (wear). Try to lever against the outer balljoint for this suspension arm to check for movement.



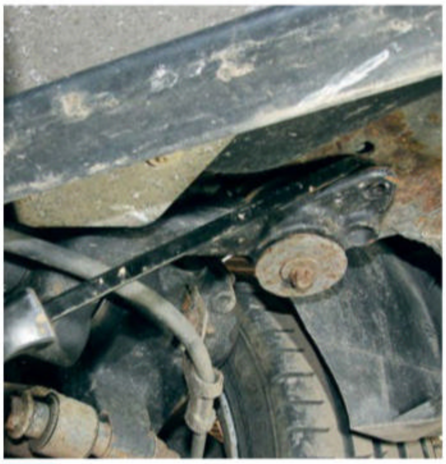
31 LEVER LOWER ENGINE MOUNT

There's a large dogbone-style mount secured to the engine block and sump. Lever against it with a pry bar to check for wear. The one shown here was worn and displayed excessive movement.



32 CHECK REAR DAMPERS

There are no coil springs at the rear, only telescopic dampers. Look around them for leaks (misting of oil). Inspect their mounting bushes – the offside lower mount shown here had perished. Lever against them with a pry bar to check for excessive movement.



33 INSPECT REAR BEAM MOUNTS

The rear beam axle has four mounting points (two on each side), so inspect their rubber bushes for perishing and lever against them with a pry bar to look for movement.

34 WORN BEAM BEARINGS

Mark Shipman at AES says the bearings inside the rear beam can fail, but the only way of telling this is when the adjacent road wheel starts to foul the inside of the wheelarch. Fitting a reconditioned beam assembly is often the most economical solution.

SERVICE SCHEDULE

RECOMMENDED SERVICE SCHEDULE

EVERY 20,000 MILES or 24 MONTHS

- Change engine oil & oil filter
- Change cabin filter
- Check coolant level
- Check tyre condition, pressure & tread
- Top up screenwash fluid
- Check battery
- Check wiper blades & washer jets
- Check all underbonnet components & hoses for fluid leaks
- Inspect brakes
- Check steering & suspension components
- Check auxiliary drive belt
- Inspect exhaust system & mountings
- Check operation of all electrical systems
- Lubricate all locks & hinges
- Check brake fluid level

EVERY 40,000 MILES or 24 MONTHS

- Change brake fluid

EVERY 40,000 MILES

- Renew air filter
- Renew spark plugs

EVERY 80,000 MILES

- Refresh engine coolant

EVERY 80,000 MILES or 120 MONTHS

- Change timing belt and tensioner, plus auxiliary drive belt

Don't forget to also

- **Top up the SCREENWASH RESERVOIR. Operate the windscreen wipers and washers to check their spray pattern and to look for blocked washer jets. Inspect all wiper blades for splits in the rubber.**
- **Check all EXTERIOR LIGHTING including the numberplate lights.**
- **LUBE LOCKS by spraying a light grease over the bonnet-locking mechanism in the middle of the slam panel. Spray more grease on to the hinges and the check straps for the doors.**
- **Use a multimeter or battery tester to check the voltage of the 12V BATTERY. Make sure it's securely fitted along with its connections – add a smear of petroleum jelly to the terminals to prevent corrosion.**
- **Inspect all rubber hangers and mounting points for the EXHAUST SYSTEM to ensure they are intact. Listen for leaks from the exhaust system.**
- **Inspect both sidewalls of each TYRE to look for bulges, perishing and damage. Make sure the tread depth is above the tread wear indicators.**
- **Tighten the WHEEL BOLTS to 100Nm – for steel wheels tighten to 100Nm, slacken by 360° and tighten again to 100Nm.**
- **RESET SERVICE LIGHT Press the button on the lower right of the dashboard display, then switch on the ignition and wait a few seconds. Eventually, the dashboard will display a number and count it down to zero to reset the service light. When switching on the ignition again, check that 20,000 miles is displayed until the next service is due.**

Help!

Your *non-diagnostic* vehicle-related problems solved by **Steve Rothwell**

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FORD FIESTA

Oil pressure gauge

Q I am fully aware of the consequences of owning a Ford Fiesta 1.0 "EcoBoom". I have serviced my 2015 Ford Fiesta 1.0 EcoBoost myself for the last four years and have always used the Ford grade oil to the correct specification.

The engine runs perfectly but as you well know it's a ticking time bomb. We all know it's a ridiculous idea to put a rubber belt running in oil even though its specially designed to do so – obviously not!

I have been quoted £1600 to change the wet belts, etc. Can I fit an oil pressure gauge to the Fiesta, if so, what pressure would I be looking for on a warmed-up engine?

Also, in your opinion what are the best/brightest road legal H7 bulbs out there?

Alan Poole

The T-piece that can be used to add a pressure gauge from the sensor outlet.

A An oil pressure gauge can be fitted, and the oil pressure switch outlet could be used with a suitable T-piece. A T-piece is available at this link https://bit.ly/CMXEkPH and there are a wide range of gauges available on both Amazon and eBay. This is the type of thing that would have been available in a number of motor accessories shops a few years ago, but does now appear to be limited to the online retailers.

I would recommend using one that has an electronic connection as running a copper tube through the bulkhead and into the vehicle would not be a simple task. This will also make finding a suitable fitting position easier.

The oil pressure should be 2 bar at 2000rpm and a gauge in the vehicle would allow you to see if the pressure was decreasing, alerting of a possible strainer blockage.

The headlamp bulbs that perform best in a number of tests are the Philips X-tremeVision Pro150, although the OSRAM Night Breaker Laser +150% H7 also score well.

FORD FIESTA

Clutch feel

Q I would like some advice about my early 2017 Ford Fiesta 1.0 EcoBoost (manual). Recently the operation of the clutch has changed. For example, when manoeuvring, if you operate the clutch several times without letting it up fully you reach a point where the clutch fully engages after lifting the pedal around 1cm from the floor – normally the clutch engages fully around the mid-point of the full pedal travel.

This also occurs where you are using the clutch to edge forward at a roundabout. Occasionally, when doing this, I have had the clutch engage with the pedal pushed fully to the floor meaning that I have had to knock the gear lever into neutral.

When you let the clutch pedal up after the problem occurs it does not seem to have the usual pressure behind it (being returned by the spring?).

Using the clutch when driving simply to change gears its operation is unchanged, and the clutch engages positively and at the pedal position as expected.

The car has recently been for a service, and I asked the garage to look at the problem. They were unable to replicate the problem but after discussion with the proprietor we have decided to replace the master cylinder. The garage has checked the system for leaks but can find none and there is no fluid leaking from the gearbox/clutch housing.

From my description of the problem, would you think that we are following the correct path in thinking that the problem is likely to be fluid leaking past the seals in the master cylinder?

Is there anything else that you would suggest looking at? I am a subscriber to the magazine – but as an interested motorist rather than a mechanic.

If there is any more information you would like, please let me know.

David Halliburton

A The description of the symptoms does lead me to believe that it is a hydraulic fault in the system that is causing the problem you have. This may be air entering through the seals of either the master or the slave cylinder.

As the fluid feed for this system is from the brake reservoir it can be difficult to detect a small leak of fluid when it occurs. It is also often the case that when the seals do fail to allow air to enter the system, this does not always result in a great loss of fluid but will normally give an indication of the fault by signs of damp around the seals.

For this reason, I would first check the master cylinder at the point the push rod from the pedal enters the cylinder and look for any signs of damp around the seal.

If there are no signs, then it may be the case that the clutch slave cylinder is the source of the problem, but as accessing this would involve removing the gearbox, it would be sensible if replacing this to also replace the clutch assembly.

Given the costs involved, I would agree with the proprietor of your garage that replacing the clutch master cylinder may be the best first step.

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VAUXHALL ZAFIRA

Clutch pedal

Q I am after some information on a 2015 Vauxhall Zafira 1.4 petrol – every now and then the clutch pedal will not return when changing gear but will pull back up by hand and is fine until the next time. I have been told it might be the concentric slave cylinder but really need if possible some advice on what you might think is the issue. The fluid level is fine and no sign of leaking out of bellhousing – is it true that this is a problem with some Vauxhalls?

I today found that the clutch pedal was fully down to the floor, the Zafira had only stood for about five minutes at the most, I was able to lift the pedal back up but found when pressed again there was no resistance on the pedal, but it returned to normal on the second operation and was OK after that.

Steven Tasker

A The symptoms you have with the feel of the clutch pedal do indicate more of a master cylinder problem than the concentric slave cylinder. If this were a slave cylinder problem, I would expect either a leak and loss of fluid to be detected, or air in the system that would allow the pedal to then need pumping up to restore the full operation of the clutch.

Providing that when the pedal goes to the floor and stays there, that the clutch is not at this point disengaged, which may indicate a sticking concentric slave cylinder, then I would suspect that it is the seals in the clutch master cylinder that are causing this problem to occur.

It may be worth attempting to bleed out the clutch in an effort to ensure that air is not being drawn into the system from a failing concentric slave cylinder, but if the problem is the master cylinder this may result in total failure and so should be attempted with caution.

VAUXHALL CORSA

Heater fan

Q My present problem is with the heater fan on my daughter's 2012 Vauxhall Corsa D. When this stopped working, my first thought was that the resistor pack seems to be a common failure point, though I would have expected that in the event of this failing, high speed would still be available.

Before removing the resistor (always going to be awkward for access, but the designer seems to have tried to make it extra awkward), I unplugged the connector from the fan and checked for voltage here, finding battery voltage on the full speed setting and nothing on the lower speeds.

Although the fan should still have been able to run on high speed only, with the resistor clearly also faulty, I renewed it. Incidentally, I also renewed the pollen filter, which was the original, but not too badly fouled. Now found voltage at the fan connector on all speed positions, but fan still not running.

Took the fan out and found it to run OK when connected directly to the battery. Put the fan back and now found it to run normally on all speed settings. Switched on and off umpteen times and found it apparently OK. The following day it would not run at all. Any suggestions?

Martin Keating

The heater blower fan and motor on the 2012 Vauxhall Corsa.

A This may be a problem with a fan bearing which could be preventing the fan from spinning freely. The act of removing it from the housing and then running it up with a direct feed, may have been sufficient to then allow it to operate again for a short time until it was again left to sit still.

The first quick test would be to check the resistance of the continuity through the motor, by using an Ohm meter connected to both terminals of the motor you should have a reading between 0 to 0.5 ohms. Anything above this may be showing a high resistance internally indicating that the motor has a fault in the windings.

The circuit diagram I have shows that the motor should have a constant 12-volt feed, and the resistor is placed in the earth return and the resistance in this return circuit is the controlling factor in the fans speed. This can be tested again using an ohm meter, and it may be the case that the blower switch or the earth from the blower switch is at fault and this should be checked.

I would first as the fan is easily removed, take the fan out again and see if it will operate from the feed in the vehicle after a little push to get it moving. It would also be worth seeing if the fan will operate in position before removal by earthing out the fan to bypass the resistor/blower switch. If the fan does immediately operate then it may be the switch or the earth from the switch that is the source of the problem.

I later received a reply from Martin

With the fan and resistor pack now replaced it's all running OK. After fifty odd years of looking after my own car, and now fifteen years of looking after two daughters' cars, this is the first time I have had a heater fan failure. I think it was probably a sticky brush holder, though like many things on cars it's not made to be repairable. Resistance through the brush gear would not much change the resistance measured between the motor terminals, this being presumably a shunt motor. The impeller securing screw was heavily corroded. The exposed metal parts on the resistor pack were also corroded. Curiously, the date marking on the fan shows it to be four years older than the car.

Incidentally, I came across a YouTube video showing a better method of checking the resistor pack in situ, rather than just checking for voltage at the motor terminals, as I did. The video made up a high wattage test lamp using a headlamp bulb. With this connected to the motor supply it could be seen to glow with varying degrees of brightness according to the switch position. Thanks for your help.

Martin Keating

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FIAT 500

Exhaust replacement

Q My wife has a 2015 Fiat 500L Popstar 1.4. I seem to have a hard job finding a supplier for the exhaust back box section. Originally it was a one-piece system until it developed corrosion in the front flexi section and started "blowing". I took it to an exhaust fitting centre who fitted the front section of a two-part system – they cut and shut the original back box on, which wasn't too bad.

I think I did ask them to change the lot at the time but I believe they couldn't locate a back box, so they made good as well as they could. I have tried a few times on the Internet searching for a replacement back box but not much luck. I was hoping you may have better knowledge where to look and let me know.

Jim Cooke

A I have found a supplier who does list the back box on your wife's Fiat 500L, but this is showing as out of stock. I would also have concerns that the cut and shut that has been applied, may not match a competitor's system. The alternative is to contact a supplier such as this one https://bit.ly/3SqdSp1 who would be able to supply a OEM standard, bolt on exhaust systems, which according to their website they are able to supply and fit OEM style exhaust systems for a huge range of cars, which will be as good as the manufacturers original part, but at a fraction of the price.

FIAT PANDA

Soft brake pedal

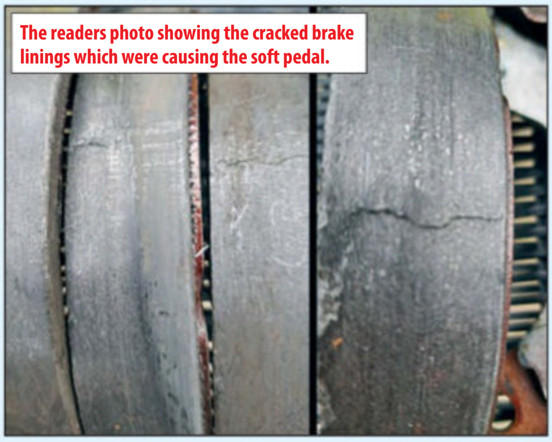
Q Some time back I got in touch about my 2011 Fiat Panda 1.2 that had a soft brake pedal. As I said at the time everything was replaced even down to new rear drum and shoes, cylinders and a fitting kit.

New brake pipes and rear hoses where also fitted. I even purchased a pressure bleeder. So, the brakes worked but I was never happy with them. The MOT was due, so I did a pre-MOT inspection.

On removing the rear drums, the rear shoes were a mess with cracks on every shoe. This is my wife's car and these shoes had only covered less than 4000 miles bearing in mind I changed the drums as well. I went to the factors and got the only set of shoes they had in stock 'Pagid'. I have fitted the shoes, and the brakes are now perfect.

The MOT tester remarked on how good the brakes were. I am sending you a picture of the old shoes.

Ray Reeve



The readers photo showing the cracked brake linings which were causing the soft pedal.

A It is difficult to say why the previous set of brake shoes should have failed in such a way, but their replacement and the resulting vast improvement of the braking efficiency is testament that the shoes were at the root of the problem.

It is possible that the shoes had been subject to adverse conditions in storage before they were sold to you, either this or there was a problem in the manufacturing.

I would, if you do have the original receipt for these ask the supplying factor to return them to the manufacturer with a view to testing them to determine the reason for this premature failure.

Whilst I cannot guarantee that the company will admit a fault in the product, it would be good to ensure that they are aware of this defect.

FIAT DOBLO

Kangarooing

Q I would be grateful if you could shed some light on a small problem I have with my 2020 Fiat Doblo 16v SX Multijet van fitted with a 1248cc diesel engine.

Since I first got the van I have noticed a slight hesitation bordering on a kangarooing feel when driving in a high gear with very small throttle opening when travelling on the flat or slightly downhill. If you take your foot off the throttle, the symptoms go. I have noticed that it never seems to happen when on cruise control.

I am also under the impression that it is worse the longer one goes after opening the fuel filler cap. I suspected fuel starvation and I do notice an inrush of air when the cap is removed. I have been told that the ventilation on the fuel system does not rely on an air bleed through the cap – is this correct?

I approached the main Fiat garage where I purchased the van and they tell me that this is a feature of the Euro 6 engine and must be tolerated. I wonder about the truth of this.

The van is due for its service at the Fiat garage shortly and it would be very nice to have your opinion so that I may get the garage to carry out any corrective work required.

Stuart Churcher

A I would first say that the information you have been given on the fuel tank not breathing through the fuel cap is correct. Modern fuel systems do have a more complex venting system to prevent the gasses from the fuel tank entering the atmosphere and so the hiss you hear when removing the filler cap is normal.

Unfortunately, without driving your Fiat it is difficult for me to comment on the problem but as the fault does not occur when using the cruise control, then I suspect that this is purely due to the restrictions placed on the engine allowing it to meet the Euro 6 specifications. This is effectively reducing the power and altering the output of the engine. When cruise control is engaged, the engine management system will compensate for the load on the engine which may not be the case when driving along without the assistance of cruise control.

If you feel the vehicle does have a problem and the garage are insisting this is a characteristic of the vehicle, I would ask to drive another vehicle of the same specification to see if this is the case. You can then compare the feel of the vehicle directly with the feel of your vehicle.

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VOLVO XC60

Power boot

Q I have a 2014 Volvo XC60 2.4D AWD and I am having problems with the closing of the power boot door (tailgate). At the moment if you open the boot by the switch on the boot door (by the number plate lights) it will open when you give it a little lift at the same time.

The problem in the last week or two has benn when you press the close button, the boot will get about halfway closed and then stop. It can take a further two or three presses of the close button to get it to close and this will only happen if you have your hand on the boot door to help it close.

I have scanned the car and the fault code that is coming up is "POT-C10167 Boot/Trunk Primary switch. Algorithm based failures. Signal incorrect after event" Just wondering if you could help me to pinpoint this 'switch'?

The 'common fault' on the web is the struts but there are also two control modules onto the boot door, one were the two electro mechanical struts are connected into (Volvo Part Number: 31386707) and the other module is connected to the boot door lock (Volvo Part No: 31335116).

The struts seem to be in good enough condition – there doesn't seem to be lumps or bumps under the plastic covers, etc.

The strut part numbers are LHS: '31386705 LH' and RHS: '31386706 RH'.

I can see why people would think the struts are the main problem, because if these start to get tighter the switch might sense this and think that something is caught in the door and stops the closing of the door.

Finally, I have had the car now nearly four years and the button on the key fob for opening the boot door never really worked properly – you would have to press the button once for it to unlatch the lock and then press it a second time for it to open the boot door.

Any suggestions will be appreciated.

Martin Butler

A Autodata do list this as a common problem on your Volvo and the cause is said to be unsatisfactory design of the tailgate opening-closing motor. The remedy for this is to replace both tailgate opening-closing motors with modified version, and then to re-program the tailgate control module with upgraded software. This problem would normally give the fault code of POT-B108467 and this is not the code you have, and so may not be applicable in your case.

The control module is located in the tailgate and the sensor for the lock is integrated into the boot lock assembly. This is the switch referred to in the explanation of the code.

The systems operate with the power Operated Tailgate Module (POT) checking that the signal from the switch is in the fully closed position. The diagnostic trouble code P101767 which is the one I am presuming you have read off is stored if the control module detects that the switch when completely closed, does not change its status.

This is caused by a faulty switch with possibly an internal open circuit or wiring to the switch. It should be possible to check the operation of the switch using an ohm meter.

VOLVO V60

Tyre tread depth

Q Today I bought new Firestone Roadhawk tyres for my 2017 Volvo V60 from a major tyre fitter outlet. I thought that the tread looked shallow so I measured them. They had ~6.7mm tread depth. I then compared this with tyres on my wife's 2020 Honda Jazz (with 3000km on the clock). This has the original Michelin Energy Saver tyres.

The Honda rear tyres have 7.8mm of tread (the front had a little less). What's going on here? Should we be asking tyre suppliers about the tread depth on new tyres (or is this already published somewhere)?

Kevin Woods

A New tyres are generally expected to have around 8mm of tread, but as you have found the tread depth on new tyres is not the same from all manufacturers. It would appear that the Firestone Roadhawk is one that appears to start life with only around 6mm of tread depth.

On the face of it this may seem as though the Firestone tyre would have around 30% less usable tread than other makes which begin life with around 8mm of tread. The truth is of course that the deeper the tread the more the tyre initially flexes and the quicker it therefore wears.

So that first 2mm of tread would wear down quicker than the following 2mm. This is something I think Firestone have considered in the manufacture of the tyres, and a softer compound which will give a greater grip, will therefore wear quicker, especially at the initial stage when the tread being deeper will flex more.

A table showing the new tread depth of tyres along with the standard noise, wet grip and fuel efficiency ratings would make interesting reading, but to date I do not believe such a table exists, unless one of our readers knows differently, in which case I would be very interested to hear about it.

VOLVO V70

Cold start

Q I have 2007 Volvo V70 2.4 D5 with 75,000 miles and when I do a cold start in the morning the engine has slight shake/rough idle for around 3 to 4 seconds, after that it runs fine, pulls well, etc. Somebody said to me that it could be a lazy injector – is this possible? Have you any suggestions what I can do, which would be most appreciated.

James Forrest

A As the problem does only occur for a matter of three to four seconds, the likelihood of the problem being an injector is quite low. Any poor spray pattern from an injector would normally cause a problem that would last at least until the engine had reached operating temperature and this could then continue.

A more common source of the trouble may be a glow plug, which is failing to warm the cylinder fully, or possibly a glow plug module which is timing out fractionally too early, preventing the cylinders from achieving the desired cold start temperature.

Your 2007 Volvo V70 is on the changeover between models, and so it is difficult to say which system you have, but it is possible that the glow-plugs in your Volvo operate at 4.4 volts, and so if you do test them, this must be done with an ohm meter, and not by removing them and using a 12-volt feed in an attempt to operate them.

Another possible cause may be a sticky EGR valve, but as this problem is at the moment only giving concern within the first few seconds of starting, I would as a first move use a diesel system cleaner. This may help remove any carbon deposits that could cause the EGR valve to stick.

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DAEWOO LEGANZA

Strut nut

Q I have a 2002 Daewoo Leganza, although my enquiry would apply to most vehicles I think and may be of benefit to other readers.

I recently replaced the offside rear suspension strut – including new damper and top mount. When I came to tighten/torque the top damper nut on the bench, I initially used a small spanner on the squared end of the damper rod to stop it rotating, and a normal ring spanner (22mm) to tighten the nut itself – however when it came to finish off with the correct torque, my torque wrench was of the type that prevented access to the end of the rod with the spanner to stop it rotating.

In the end I tightened it as best I could off the car with the spanner – using thread lock on the nut and installed it.

I feel uneasy driving the car however as, in my mind, it wasn't done 'properly', ie. possibly 'under torqued' although I am sure it is reasonably secure. My dilemma is: should I leave well alone or, now that it is back on the car with the car's weight on the strut/damper, tentatively try and torque it to the correct figure (59 lb ft) in situ, but take the risk of the rod still rotating, or breaking the thread lock seal and possibly making it worse? With it being a rear strut there is obviously no rotational movement, but there would be the potential for up and down movement/vibration.

What advice would you give in this situation? I like to do things correctly, ie. by the book, but this was an occasion when I couldn't. Thank you.

Hugh Jones

A The problem of correctly tightening the strut top nut, is quite common due to the problems retaining the shock absorber shaft whilst tightening the top nut without the benefit of the correct tool and I suspect that many top suspension nuts have been fitted without the benefit of the special tool and without any adverse effect.

It is difficult to comment on your Daewoo as you can appreciate I have no way of knowing how much pressure was used when tightening the nut, but from your explanation of the process, I would suspect that you have tightened the nut sufficiently, and as you have used a locking compound on the thread I suggest that the best course of action would be to dab a small dot of paint at the top of the nut at the point it contacts with the thread.

This can then be checked to ensure that there is no movement of the nut, if the paint dot remains unmoved, then I would be happy to leave things as they are, if on the other hand the paint dot did show that the nut has moved, however slightly, then I would reconsider the need to torque the nut up.

DAEWOO LEGANZA

Parking brake shoes

Q I didn't think I would need your help so soon after your most recent advice and help over my 2002 Daewoo Leganza 2.0 strut replacement. That's the problem with elderly, high mileage car – even routine jobs can be problematic! Anyway, I needed to replace the parking brake shoes as the lining on one had come detached. It's a one-piece horseshoe-shaped shoe and long story short, when I came to replace the drum/disc, it just would not fit over the new shoes. I made sure the two-moving adjuster/tappets were fully home and removed a layer of rust from the inside of the drum but still no go.

Off the car, I checked the shoes for fit with the drum in my hand and it was so tight it could only be inserted with gentle tapping. It was a pattern part so perhaps the tolerances were too big, anyway the only way I could reassemble things was to sand a fraction of a millimetre off the two parts of shoe linings and only then would it fit.

My question is why should I have had to do this and by sanding the lining, have I compromised the friction material as to make it less effective than it could be? Although it seems to be OK in action but perhaps could be better, should I nevertheless disassemble and perhaps roughen the surface of the lining with a file? Although I noticed the linings were quite smooth to begin with.

Just as an aside and on the same subject, I cleaned the actuating mechanism, ie. where the parking brake lever enters the back plate but could not for the life of me understand how it should work (although it does seem to!). I could see how one tappet would move outwards when applying the parking brake but not the other as I could see no physical link between the two in the cylinder!

I've searched the internet for perhaps an animation or drawing to explain the mechanism but no joy. Thanks again in anticipation.

Hugh Jones

A The single horseshoe arrangement is quite different from that used by most vehicles – but it is also used on a number of Hyundai, Kia and Mitsubishi models. The single shoe should fit within the brake drum section of the brake disc, and the fact that this did not does suggest that the unit was not made within the correct tolerances. Having looked at the available parts I can see that some are listed as fitting a wide range of models whilst others are restricted to the Leganza, and so I suspect that the specifications may be close but not quite exactly the same.

As you have now resembled the brakes and fabricated the shoe to fit, providing that there is no contact between the inner drum of the brake disc and the parking brake shoe, then I would be happy that this could now be left.

The parking brake should only be applied when stationary and the lining should provide enough grip for this to operate without any problems. The operation of the parking brake is quite simple with the one-piece shoe providing the return spring action and the cylinder which is cable operated simply pushing out internally to open up the brake shoe when the handbrake is applied. The adjustment is also within this cylinder.

The single piece horseshoe parking brake shoe fitted to the Leganza.

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HYUNDAI COUPE

ABS issue

Q I'm wondering if you can give me a steer in the right direction?

I recently bought a 2008 Hyundai Coupe SIII 2.0 16v, engine code G4GC. The only issue it has is a fault with the ABS system which occurs when I press the brake pedal, it doesn't take much pressure for the pedal to 'kick back' and it will do this two, three or four times before the car has come to a halt. If I keep my foot on the pedal sometimes the pedal will drop down slightly? I have also heard a clicking sound whilst driving (four or five clicks which repeats) and then the ABS light comes on.

The brakes still work fine though obviously there's no ABS function. I have checked for codes using a Maxiscan 309 and a Launch CRP123 and both return no codes found?

I have noticed that both solid front brake pipes have been renewed, the driver's side from the ABS unit to the flexible pipe and the passenger side joins via a union.

I wondered if there could be an air lock in the ABS unit or if one of the valves in the unit could be sticking and causing this issue. Is there a specific way of bleeding the ABS unit? Can I check the resistance of wheel sensors from the connector at the ABS unit to prove they're not at fault, if so, what pins should I use and what readings should I expect to get?

Neil Roberts

A The Hyundai workshop manual states that pedal kick back is normal, and as such gives little diagnosis detail on investigating such a problem. This though does not confirm that the kick back you have is acceptable. The manual also explains noises from the system as operational and generated within the ABS unit. If there are no fault codes, then it may be that the system is working correctly. When the light comes on, a code should be in the system and if you can read the codes off at this point it may help in the diagnosis.

With no codes present, if your scanner supports live data then I would first check the speed sensors using this to ensure that when driving along, they all register the correct speed. I would suspect that a faulty sensor would flag a code up.

It is possible that the kick back is a result of the ABS system kicking in prematurely due to the perception that one of the wheels is locking. This could occur due to incorrect data from the sensors.

The resistance of the speed sensor when measured with an ohm meter is given as 1388 +/- 110 Ω. The manual also instructs to test by connecting a voltmeter between the wheel speed sensor terminals and measure the voltage by turning the wheel. It does not however give the value of the voltage but simply says that AC voltage detected is sufficient.

If you can find no faults, then bleeding the brakes would be an option.

The bleeding of the brakes should be carried out using the Hyundai Hi-Scan pro to operate the ABS pump during bleeding, if your scanner has this function then it would be worth attempting to bleed the brakes using the scanner to operate the ABS pump and solenoid valve. This should ensure that any air in the system is expelled. As you have noticed that the brake pipes have been replaced, it may well be the case that it is air in the system causing the kick back.

HYUNDAI i20

Handbrake operation

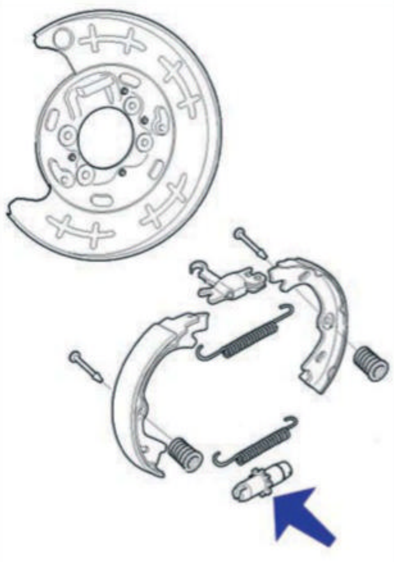
Q My wife's 2014 Hyundai i20, failed its MOT on 38,000 miles with a number of handbrake defects, excessive movement of parking brake lever, parking brake inoperative on one side, parking brake efficiency below requirements. The handbrake shoes were replaced and an MOT certificate issued.

I am assuming the components were changed and fitted correctly. Since last year the car has covered around 3000 miles and having driven it for the first time last week I feel the handbrake is woeful! I experienced the car rolling on inclines and the handbrake has to be pulled very high to feel a positive bite. There is some upwards slack in the lever before the first 'click'. I've discounted the shape and height of the lever against the seat clouding my judgement.

The car is fitted with rear discs and I believe the handbrake is the 'shoe in the drum' type. There are numerous reports on the internet of poor Hyundai handbrakes and cars rolling away and maybe I am expecting too much against my experience of electronic and drum brake type parking brakes. I've always set-up handbrakes to hold on 3-4 clicks and having tried to adjust the cable at the lever end, I cannot reduce the travel.

Would the i20 set-up contain a toothed adjuster similar to the type fitted to conventional drum and shoe set ups? Do you think this would improve the handbrake performance if I was to manually set-up the shoe/drum clearance?

Luke Calladine



The handbrake shoe adjuster can be reached via a small hole in the disc.

A I would first mention that the old rule of thumb of three to four notches on the handbrake does not now apply as there are a lot of factors which now vary. The recommended setting for your Hyundai is six to eight notches.

The parking brake shoes can be adjusted from within the brake disc, and this is the best method of adjusting them, and will give the best feel to the handbrake. The adjuster unit is at the base of the handbrake shoes and can be levered round using a small plain screwdriver through the sight hole in the brake disc.

The correct setting is to first slacken off the handbrake cable, then rotate the toothed wheel on the adjuster until the brake drum is locked and the adjuster is tight, then it should be backed off five notches. The disc/drum should then rotate freely. Once this is completed the handbrake cable can be adjusted to give the six to eight clicks of travel.

Adjusting the handbrake using this method, you should find that you do have a good solid handbrake which can hold on any hill.

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HYUNDAI i10

Brake fluid change

Q I changed the brake fluid on my wife's Hyundai i10. I know that it is recommended to change fluid every two years and I've done this for the last few years. However, I must confess there has always been an element of guesswork as to the quantity of old fluid to bleed out, there doesn't appear to be any colour change new to old when changed at the recommended time to help.

Could you please advise on quantities so I can remove guesswork from the next fluid change?

Bruce Harding

A I have the full i10 workshop manual and I could tell you the specification of the brake master cylinder and that the servo boost ratio is 4.5:1. I could also tell you every torque setting in the system, but the entry for brake fluid simply says "as required" and no total capacity is supplied.

I would expect the complete system to hold no more than 1 litre of fluid and I would be happy that having flushed around 200ml of fluid from each bleed screw that the fluid had been sufficiently refreshed.

HYUNDAI i10

Daytime lamps

Q During the past week or so on my 2018 Hyundai i10 1.0 I have noticed that the daytime running lamps are staying on, when the headlamps are switched on, when they should automatically switch off. The side lights are working normally. I suspect the fault is possibly a fuse or relay, but I cannot find either a description, or visual evidence of driving or headlamp dipped or full beam on the engine fusebox or inside fusebox (drivers side). Searching online I also discovered many Hyundai i10 drivers are also having difficulty finding the relays/fuses.

In my owner's manual there is a fuse/relay description of an engine compartment main fuse panel, numbered 1 to 12 with headlamp high and low relays numbered 4 and 5 but cannot find this panel anywhere.

I am tempted to tap into the wiring near the driving lamps which is difficult to access and fit my own switch, but I know the fault will still be there.

I would appreciate your help.

Antoine Cousin

A Daytime running lights should either dim or extinguish when the headlamps are turned on. This operation is control by the DRL module which should be located under the dash on the driver's side towards the centre. It is normally quite easy to locate and on Hyundai and Kia models can be marked with a sticker indicating "UNIT ASSY-DRL".

The DRL system on some models does incorporate a warning light on the dash if the system is not operating correctly, as you do not have this warning light on, the fault may be that the module is not getting a signal indicating that the headlamps are on, and this could be the reason that the daytime driving lights do not extinguish. For this reason, I would locate the DRL module and ensure the connecting plug is located fully and the terminals are clean, it could be a simple case of a poor connection causing the issue.

I would not expect this problem to be a fuse issue as they do work – and if the fuse were blown there would be no power to the lights. The interior fusebox should be located up under the dash on the driver's side to the far right. The details I have do not indicate that any exterior lighting fuses will help within this area.

HYUNDAI i20

Sat-nav update

Q The car is a 2020 Hyundai i20 which I have owned for a couple of months. I need to update the sat-nav map. I have downloaded the sat-nav update app from Hyundai onto my PC.

The problem is I cannot remove the SD card from the sat-nav slot in the car – it seems to be jammed solid. Judicious attempts to gently prise it out have failed and I am worried about damaging the SD card or slot if I use too much force.

I assume the SD card should just pop out after being pressed inwards like other SD cards? Am I missing something? Would this be a dealer only job?

Mark Dawson

A The SD card should simply push inwards slightly and then pop out allowing its removal. There is no locking device and so if the card is not moving it does sound as though it is jammed. I would return it to the supplying dealer to check the reason for this fault as it should be removable. It is possible that the previous owner has somehow fitted it in a way that is causing this, but whatever the circumstances I would expect the supplying dealer to remedy the situation for you.

HYUNDAI i10

Tyre pressure monitoring system

Q I have a 2018 Hyundai i10 (997cc). This is the first vehicle I have owned which is fitted with a tyre pressure monitoring system. I intend to swap the wheels round on each side to equalise the wear and would like to know if this will upset the TPMS in any way? The tyre pressures front and rear are the same and I always ensure they're set correctly.

Eric Armer

A The TPMS on your Hyundai operates using sensors located in each wheel. The TPMS monitors the tyre pressures in all road wheels while the vehicle is moving or stationary. There is a non-replaceable battery incorporated in each TPMS sensor.

The system needs to be reset after tyre pressure adjustment, a TPMS sensor replacement or when the wheels have been changed to different positions on the vehicle.

This is done as follows: Ensure the tyres are inflated to the manufacturer's recommended pressures. Drive the vehicle at above 16mph for up to 20 minutes, the TPMS will learn the new values and the system will be reset.

It is also possible to reset the TPMS sensors using diagnostic equipment.

The tyre pressure monitoring valve fitted in each wheel.

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KIA PICANTO

Intermittent non-start

Q I have a 2018 (67-reg) Kia Picanto 1.0 66hp base model. The car has an intermittent problem of not starting. I had, for reasons I can't remember, changed the key I was using to the spare key, and it was shortly after this the problem appeared. After using the spare key for a few weeks, I decided to change back to the key I was originally using and the problem "went away" for almost an entire year. In this time, I took the car to an Arnold Clark dealer to be checked who said they found no issue. The problem has since returned with both keys.

The problem is that very intermittently, when I go to start the car with the clutch down, there is a click and nothing else. Normally, lifting my foot off the clutch, removing the key and repeating the process will have the engine start. However, recently it has taken up to three or four goes at starting before the engine turns and starts. And this is happening on a more frequent basis.

When the car is running it runs perfectly. No issues, no signs of problems. When it does crank it cranks promptly and has not taken any longer to "fire" than before.

I have the car booked into another dealer for them to check it out as I do not want to be left stranded by it not starting.

Have you seen such a problem before? I was obviously thinking a key may have been needing reprogrammed as returning to the original seemed to fix the issue for a year.

I am also now wondering if the battery possibly has a dead – or dying cell. How could I check this? I have also been thinking perhaps there are corroded connection to the starter motor?

As you can imagine this is a very frustrating issue and any light you may be able to throw on it would be much appreciated. Thank you.

Garfield Tait

A There are several possible scenarios and as you can hear a clicking when turning the key, the first may be that the starter motor relay is failing. If this is the clicking you can hear then it may be the case that the relay, although operating, is not completing the circuit. This is relay number 3 in the underbonnet fusebox and it would be worth checking this. A firm tap on the relay when the non-start scenario occurs may revel this as the issue.

Other reasons may be a poor connection to the starter as you have suggested, or it may be a dead spot on the starter itself. A poor connection on the earth strap to the engine is another possible source of the issue.

As this vehicle does require the clutch to be depressed in order to start the engine, it may also be the case that it is the clutch position switch that is failing. This theory would also be backed up by the fact that the action of repeating the depressing of the clutch, and so re-operating the clutch switch, does allow the engine to spin over.

A test that could be carried out would be to leave your foot on the clutch and attempt to start again without moving the clutch pedal. If the engine does not then spin over, then this could point to the clutch switch.

As this switch is quite a cheap component, I may be inclined to replace this as a matter of course if in doubt.

I do expect that the dealer should be able to gain a deeper insight into this issue once connected to the diagnostic equipment, and if the problem is related to the immobiliser or the key recognition this should be picked up, but these are the areas I would check.

KIA SPORTAGE

Oil light

Q With clean oil at the correct level, the red oil light on my 2007 Kia Sportage 2.0 XS Diesel comes on whilst driving (sometimes flickers then goes out and very often stays on). No loss of power or oil and car drives as normal. I could not find the location of the oil pressure switch and are there any other checks I can do to clear the fault?

Mervyn Stead

The oil pressure switch may be faulty and should be renewed first.

A My first recommendation would be to replace the oil pressure switch to ensure this is not faulty. Ideally an oil pressure test should be carried out, but as a new switch would be a cheaper option this may be the best first move.

If the flickering light then continues, an oil pressure check would be needed. The oil pressure in your Kia should be 3.9 Bar at 1500rpm.

One of the possible problems allowing the oil pressure to drop is the relief valve in the base of the oil filter housing. It may be worth removing the cap at the base of the oil filer housing and dropping down the spring and relief plunger, to ensure that they are clean and free moving.

The oil pressure switch on your Kia is located at the rear of the engine block close to the flywheel end and sits just besides the crankshaft sensor. The lead and plug going to it has a cover which goes over the switch making it slight more awkward to actually see.

This is something I would investigate as a matter of urgency, as if the light is flickering due to low oil pressure, this will allow wear to take place in the engine and the situation may rapidly deteriorate.

KIA SOUL

Scooter charge

Q I am hoping you can help. I drive a 2015 Kia Soul 1.5 diesel auto. I am hoping I can charge a small 12-volt mobility scooter from the cigarette lighter when driving. I understand that I will have to turn it off when parked to stop the battery going flat. Many thanks.

Graham Moore

A From the details I have, the axillary power socket on your Kia is rated at 20 amps and there is also a listing for a cigarette lighter outlet which is rated at 25 Amps. Providing the scooter charger is not rated higher than 20 Amps, either of these outlets will be perfectly acceptable to use.

From a quick look at the various mobility scooters on the market, the average charger for these is rated around 8 Amps, and so this is perfectly acceptable, and will be capable of charging your mobility scooter whilst travelling in your Kia.

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KIA PICANTO

Poor clutch feel

Q I have a 2009 Kia Picanto which has done 77,000 miles. When I press the clutch, the travel isn't smooth. When I depress the pedal, after the free play has been taken up and the pedal starts to go down smoothly, I then feel some resistance about halfway down and the pedal needs extra pressure to pass this point.

The pedal travel is then smooth again, do you think this could be a problem with the clutch or the cable? In your opinion, do you think I should change the clutch.

John Evans

A You have not mentioned which engine you have in your Kia and I am presuming It is the petrol version as the diesel version has a hydraulic clutch system. Whilst the symptoms may be due to wear in the clutch itself, as the cable is quite easily accessible and as you do not mention any untoward sounds accompanying the clutch operation I would first try lubricating the cable to see if this eases the symptoms. Whilst lubricating the cable may or may not last, it will at least eliminate the fault being in the clutch assembly itself.

Looking at the front of the gearbox you will see the cable with a large plastic adjuster at the top, by undoing the adjuster a few turns the cable should loosen off sufficiently to lift the yoke for the clutch release lever enabling the cable to be lifted up and out.

Once out, the cable should be held up and a thin oil run down between the inner and outer cable, operating the cable a few times will help draw the oil down through the cable.

After allowing the oil to run down, the cable can be refitted and the adjuster nut tighten back to allow 3-4mm of play at the cable. This should set the pedal height to around 180.3mm from the floor, with 15-20mm of free travel at the pedal.

If this changes the feel of the clutch it may be only a new cable that will be required, but if the feel of the clutch operation does not change, it is probably the clutch at fault. Replacing the clutch assembly has a book time of three hours.

KIA SPORTAGE

Clutch & DMF

Q I am having problems with a 2010 Kia Sportage 2.0. The car seems to now and then feel like the clutch is slipping in 3rd but then seems fine other times? It has done 170,000 miles and pedal does seem high. Is it needing a new clutch and dual mass? If so, is this a big job?

Stuart Anderson

A From the symptoms, I would think that the clutch may be at a stage where it does need replacing. The release mechanism on your Sportage is hydraulic and so there is no adjustment possible to alter the pedal position.

The job time to replace both the clutch and the DMF on the 2.0 AWD Kia Sportage is 3.6 hours, so this is not a troublesome job. Like most transverse engine layout the engine will need supporting to remove the gearbox and this can be done with a support beam from the top of the engine.

It may not necessarily require the DMF – although from experience and with the mileage of your vehicle – then it is likely that the DMF will need to be replaced along with the clutch assembly.

KIA SOUL

Belt or chain

Q Just a quick one that I hope you can help with. My daughter has bought a 2012 Kia Soul petrol with engine code GF4D. Does this vehicle have a timing chain or belt? If the latter what would be the change interval?

Gary Mills

A I can confirm that the Kia 1.6 with the engine code GF4D has a timing chain and so this does not have a replacement schedule.

Like all chain-driven engines, the oil should be changed regularly to preserve the life of the chain. If the chain did need changing (which I would not anticipate) the labour time for the job is 3.5 hours, so this is not a major task.

The GF4D engine which has a chain-driven overhead camshaft.

KIA PICANTO

Clutch judder

Q My wife has a 2009 Kia Picanto 1086cc engine code G4HG with two issues. The first is intermittent clutch judder – one day drives fine, the next severe judder for no apparent reason. There seems to be no issues with external operating levers, and I can find no significant play in engine mounts. Although clutch kits are not too expensive for this vehicle, I'd value your opinion before I purchase one and dismantle everything. I'm 99.9% certain it does not have a DMF, but I believe there is no flywheel spigot bearing for the gearbox input shaft. Could this be relevant?

The second and less serious issue is intermittent remote central locking. When this happens the button on either of the two key fobs has no effect but the central locking works normally with the key in the driver's door lock. I'm guessing there could be bad connections somewhere. Can you advise if this vehicle has a receiver aerial and if so it's location? Or is it part of a body control module and if so, where is that located?

Bob McIntosh

A From the details I have your wife's Kia should not be fitted with a DMF, and as you have correctly noted it does not have a spigot bearing for the input shaft, this is though quite standard now. The judder may be for several reasons and one of the most common, is that the centre plate is sticking on the splines – this can give the intermittent feeling of a judder. Another possible reason may be contamination on the surface of the centre plate, or it is possible that a distorted pressure plate diaphragm spring or failed spring in the centre plate are the source of the issue.

I do believe that the remedy will require the removal of the gearbox, in which case it would be worth renewing the clutch assembly. The job time for this is three hours.

With regard to the intermittent key fob operation, this may be due to a failing door lock control relay, and this is located at the nearside of the vehicle in the passenger footwell area. The signal is received by the body control module, and this is located at the centre of the dash area towards the base of the heater unit.

As the problem is intermittent, I would check the relay to ensure the connections are good, and the BCM. The problem may be a poor connection at some point.

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KIA SPORTAGE

Stop-Start

Q Having previously owned a Lexus RX450h and a Toyota CH-R 2.0 on which I was constantly charging the 12V battery, especially on the Toyota – I now have a Kia Sportage HEV 226hp which doesn't have a 12V battery but a battery override switch, which I haven't had to use which seems to be a good system.

My question is not about batteries but about the turbo – on a recent 900-mile round trip to Scotland with some stop-starts at motorway junctions, the engine being Stop-Start would cut out almost immediately when stopping.

I thought the engine would run for a bit to allow the turbo to remain lubricated and cool. Do you have any thoughts on this?

Thanks once again for your advice.

Dave Brown

A The advancement in technology and the improvement in oils and the turbo bearings, as well as the added systems on the later vehicles which allows coolant to continue flowing when the engine is stopped, are all features that ensure that damage is not occurring within the turbo when the engine is switched off.

The Stop-Start will only operate when the conditions allow, and if the engine is too cold or other demands are made on the system, then the Stop-Start will not cut in and the engine will continue to run.

I have personally imported vehicles from Japan in the past that had a device that would prevent the engine being switched off immediately after a run, and when turning the ignition off, the system would then keep the engine running at a tick-over for around 30 seconds to allow the turbo speed to be reduced naturally.

The modern turbo has been designed with the Stop-Start system in mind, and most are now water-cooled. In the same way that the starter has been adapted to cope, then so has the turbo. I would be happy that providing the oil changes are carried out at the specified interval, then no damage to the turbo will occur due to the Stop-Start system cutting in.

KIA SORENTO

SRS light

Q I have a 2005 Kia Sorento XSE 2.5 diesel. The question I ask is... the SRS light has illuminated – it comes on when ignition is switched on, goes out and comes back on. As my scanner is only a cheap model, I bought a Foxwell NT630 Plus from eBay (new). Also, I had to buy a lead off eBay to fit the 20-pin plug, which is under-bonnet offside rear bulkhead.

The scanner gives me information on engine and sensors all OK, but when I try to enter SRS airbag it just asks me if I have switched ignition on or check battery, etc. So, I wondered if it could be the extension lead or my lack of knowledge?

I'm 78-years-old and struggle with modern technology. Any help would be appreciated.

R Morley

The 20-pin adapter used on the Kia diagnostic socket.

A The SRS airbag system has a self-test function, and so this is what you are seeing when the ignition is first switched on. The system should run through its self-test, then the light should go out and stay out, unless as in your case the system has detected a fault.

The Foxwell NT630 ABS & Airbag Reset Tool, is a discontinued model, but should be able to read the codes from your Kia. The unit should plug in without an adapter into the EOBD socket to the left of the steering wheel beneath the dash.

The 20-pin plug on your Kia was mainly used on earlier models, and you may find that both the sockets are fitted to your Kia, and in this case using the EOBD socket may enable you to retrieve a fault code.

If this is not the case, then the first place to check would be fuse 21 in the kick panel fusebox. If this is not blown then the connection on the airbag control module, which is located at the rear of the centre console should be looked at. Check that the multi-plug is firmly in position.

If nothing has been found at this stage, it may be that the control module has failed, and this would then need testing.

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If you have a problem vehicle, *Car Mechanics* has the answer in the shape of our technical editor STEVE ROTHWELL. Contact Steve, as detailed below, for FREE advice on all car-related problems. Please help Steve to help you by giving as much information on the symptoms as you can – including the VEHICLE REGISTRATION NUMBER.

As *Help!* is a free service, some complex questions may require more time and resources than we can reasonably allow – when this is the case we will let you know.

Steve will reply to all queries as quickly as possible, but please allow up to 28 days for a reply. Difficult/complex questions or those requiring research may take a little longer – please be patient.

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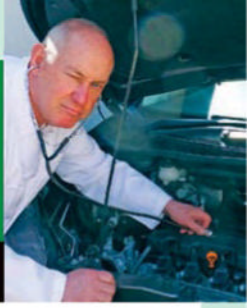


Steve Rothwell answering your **ENGINE MANAGEMENT** queries

FIAT PANDA

Code P0172 – running too rich

Q I have a problem with the Fiat Panda again! It's a 2004 1.2 petrol – after a run the EML came on. The code reader (Foxwell NT301) brought up the fault code P0172.

The air filter is new. I used the code reader to test Lambda, and values seem to be OK. I suspect the MAP sensor. I have cleared the code and the EML is clear, engine starts fine, idles OK and runs OK. Am I barking up the wrong tree? Any advice very gratefully received.

Dave Bennett

A **The code P0172 is indicating that the system is reading too rich, and this can be due to a blockage in the induction system limiting the available intake of air. Having checked the air filter is clean and with little else that may be impairing the induction system, then other sources should be checked.**

The other sources of this code can be due to the EVAP cannister purge valve, the fuel pressure, leaking injectors or a faulty O_2 sensor.

The first check would be to ensure that the pipe from the EVAP valve does not contain fuel. The only way that a faulty EVAP valve could cause the mixture to become rich would be if the EVAP system was drawing fuel from the tank and recycling that through the inlet manifold. Checking that the pipe is dry will confirm that this is not the case.

This leaves the possibility that the injectors are allowing too much fuel into the system, and one reason for this may be that the engine Coolant Temperature Sensor is reading too low, indicating to the ECU that the engine still needs the richer mixture delivered on start-up (choke) or that the fuel pressure is too high, but this is unlikely.

Reading the live data from the engine should confirm if this is the case. If the reading does comply with that which would be expected given the running temperature, then either the injectors are over-fuelling or the O_2 sensor is reading incorrectly.

It may be worth checking that the heater in the O_2 sensor is operating as if this is not, then a slow warm up time could give a problem. The integrity of the heater is easily tested with the connecting plug disconnected using an ohm meter between terminals 3 and 4 to ensure a reading of around 3.1Ω (Brown/White and Brown/Black wires). It would also be worth ensuring that the wire 4 (Brown/White wire) has a battery voltage feed when the ignition is on. This can be tested with a voltmeter between the wire and earth.

As the engine does run smoothly, I would not expect an injector fault as this would normally cause an uneven running problem. This does leave the most likely reason as the O_2 sensor.

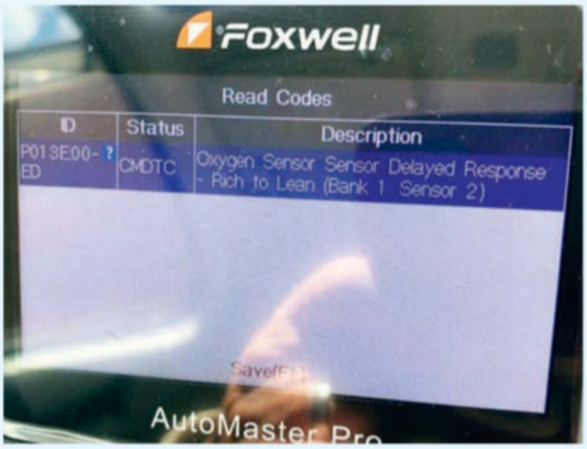
FORD FOCUS

Engine Management Light

Q I have a problem with my 2019 Focus Vignale 1.0 EcoBoost auto. The EML keeps coming on. First time, I read the code, it showed that the O_2 sensor was faulty, So I fetched it down to my local auto electrician to ask him about putting a new oxygen sensor on. He asked me a few questions and said just to use decent fuel and that will cure it. I've done that but it still keeps recurring.

I checked the fault codes again and found a new one related to crankcase pressure. Do you have any idea what may be causing both these codes to occur? I've also had a look under the bonnet but all the visible connectors I can see seem to be dry and secure. Many thanks.

Dave Carabine



ID	Status	Description
P013E00-ED	CMDTC	Oxygen Sensor Sensor Delayed Response - Rich to Lean (Bank 1 Sensor 2)

A **The code that you have read off on the screenshots (above) you kindly sent me is P013E. The other screen is not showing a fault code but referring to the live data. This would not illuminate the EML and so the code P013E would be the one to concentrate on at this time.**

The code is indicating that the heated oxygen sensor (HO2S) 2, bank 1 has a delayed response switching from rich to lean. So, in other words, it is lazy in operation.

Whilst this can be a connection or an engine control module fault, it is more likely to be the actual sensor that is at fault, and I would recommend changing it.

I do also remember the previous incident with the EML coming on and at that time the code was P2096, indicating the post-catalytic converter fuel trim (FT), bank 1 - too lean – and so this would be a different situation.

If there were to be a connection between the two codes, then I would suspect that this would be due to a poor connection in the engine control module connecting plug. The ECM on your Focus is placed in what I would consider a poor position located at the front of the nearside inner wing area.

This can be subjected to moisture and dirt thrown up from the road and so ensuring this is secure and dry – and that the connecting plug is clean would also be a good move.

With regard to the screenshot of the live data you sent, showing the crankshaft sensor input unreliable, as this is not showing the code P051B, then the sensor is probably OK, and the fault may be due to an air leak or poorly connected breather pipe. The part number for the pipe holding the sensor should be F1FZ-6758-G and this may be the source of the problem.

It is feasible that this, if failed, could also give a problem with the O_2 sensor reading which would account for the original code, but it is unlikely to be the reason for the later code you now have.

VAUXHALL VECTRA

Major engine management issues

Q I've owned my 2006 Vauxhall Vectra 1.9 CDTi 16v with manual transmission since new and spec'd it with options such as Xenon's, fold-away towbar (which mandated ESP), etc. It has now covered 166,000 miles and I have just started experiencing major engine management issues which has left everyone scratching their heads. Any thoughts would be greatly appreciated.

Initial symptoms:

- I had three or four days of the engine management light flashing on briefly at start-up. On a short journey it started running 'lumpily' albeit with no warning lights. Having experienced a similar problem a couple of years ago, I took the EGR valve off and gave it a good clean.
- On a run (to check my work) it initially ran fine, but after a couple of miles the ESP light suddenly came on and it started to lose power (dual carriageway – doing about 60mph).
- After restarting the engine, it ran fine, but again started to lose power if I went above 2500rpm. Its speed dropped to a 2/3mph crawl and refused to go above 20mph even after a restart.

I left it with my local garage. They scanned showing a variety of codes. I realise that several of these aren't relevant:

The codes found were:

- Engine: P1120-52 / P1122-52 (accelerator pedal position sensor) – P1109-05 (swirl actuator feedback - high voltage).
- ABS/TC/ESP: U2105-71 (invalid data from ECM).
- BCM: B3916-0F (no communications with alarm siren).
- DDM: B3902-00 (Wrong immobiliser identifier received).
- PAS: B0959-0F (park pilot sensor).

Martin Featherstone

Holts
PROFESSIONAL
ELECTRICAL CONTACT CLEANER

Using an electrical switch cleaner on the terminals may rectify the communication problems.

A The engine fault codes P1120 – P1122 and P1109 do all have one common denominator, and this is not only that they are all related to the throttle system, but also that they all show a circuit problem.

With this in mind the first action I would carry out would be to ensure that the engine control module connecting plug is in good order and that there are no signs of Verdigris or corrosion on any of the terminals. If this is the case and the terminals do look clean, then the next step would be to check the integrity of the loom, ensuring that it has not been compromised by water ingress. It would also be wise to check the throttle pedal connection to ensure that this plug is clean and dry.

Looking briefly at the ABS and body codes, U2105 is a data CANbus connection problem, which again is related to a poor connection at some point and the B codes are also indicating the same communication fault, although the code B3916 can indicate a failed battery in the siren.

This does all point to a wiring or connection issue, and if no external problems can be found it may be worth having the ECM tested to ensure that an internal problem is not at the heart of the problem. This can be done by ecutesting.com or remanx.com

It should be possible using the scanner that your local garage has, to check the live data from the engine, and this would also help confirm if the throttle pedal was at fault. Checking the operation of the throttle pedal on the scanners live data this should move steadily and progressively as the throttle is operated.

One other possible source of the poor running and the loss of power could be the MAF sensor. I have seen many these fail without showing any fault codes and so this is also a sensor to be considered if none of the above reveals any problems.

VOLKSWAGEN SHARAN

2.0 TDI AdBlue & codes

Q I have a Volkswagen Sharan II (N7) 2.0 TDI 115, phase 1.5, engine CFFE. It has stood about for quite a time, and I have now charged the battery and started the engine.

The code reader is Ancel VD 700 and of course the dreaded MIL and AdBlue bottle light has come on. The AdBlue tank is full, not over full. I have the codes turbocharger A underboost condition P3043 non found. NOx sensor supply voltage circuit bank 1sensor 2 P220B gen. Reductant heater A control circuit/open P20B9 gen. Heater B open P20BD gen. Any comments appreciated with ways to test.

Dawn Couzens

A The AdBlue light on may be a result of a problem in the supply pump or the level sensor, and this may be due to the long period of inactivity. This may need a dedicated VAG scanner to correctly identify the problem with this system. It also possible that this is connected to the codes P20B9 and P20BD which are indicating a circuit fault in the reductant heater control and so rectifying this fault first would be the best course of action.

The code, P3043 is referring to a fault with the fuel pump. This will be a mechanical fault and again possible due to the period of inactivity. The code P220B is referring to the Nitrogen oxides (NOx) sensor 2, bank 1 and is indicating that the supply voltage circuit has a malfunction. This is possibly showing a poor connection, and the first step would be to check and clean all the connections in the circuit, this would include the NOx sensor plug, the connections and the ECU connection.

The code P20B9 is showing that the reductant heater control A has an open circuit, and P20BD is showing that the reductant heater control B has an open circuit so again these codes would require a good check of the wiring and connectors.

Depending on where the vehicle has been parked over its latent period, it should be considered that rodent damage to the wiring has occurred. This could also be the result of the problems now faced, but if not then a general corrosion of the connection terminals may have taken place.

VOLVO XC60

EGR valve flow

Q I have a 2011 Volvo XC60 2.0 diesel. The engine management light has recently come on. It still drives well but I would like to clear the light. I used a friend's scanner to check for codes and got P1407. On the screen this said EGR valve flow.

Does this mean I need a new EGR valve or is this something that I can simply clean out or repair? I do normally do my own servicing but do not tackle brakes.

I am hoping that this is something that I could do myself. Many thanks for any help you can give.

Vick Harmon

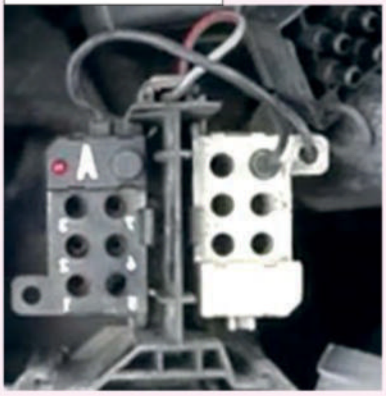
A The code that you have retrieved is indicating that no flow has been detected from the EGR valve, and this is, on your model Volvo, a common fault. This is not always due to the EGR valve, and on your engine one of the common reasons for this code is that the Manifold Absolute Pressure (MAP) sensor is faulty.

The remedy is to replace the faulty MAP sensor located on turbocharger intercooler. This should resolve the problem and allow the code to be cleared.

It is though also worth noting that the fault can be due to a pressure problem within the intercooler or that indeed the EGR valve may be blocked. For this reason, I would advise also checking to ensure that there are no leaks in the induction system and that the EGR valve is not blocked.

VOLVO 940

Uneven running



The connector under the bonnet on the Volvo used to read the fault codes.

Q My 1998 Volvo 940 2.3 turbo is running very well on LPG with a steady even output from the exhaust tailpipe hot or cold. When on petrol the same when cold, but as soon as engine is one-third of its normal temp it starts 'plopping' uneven running and stalling on tickover. If driving on petrol, full power is OK, but not smooth in steady driving.

Fault code reads 232 fuel supply too weak too rich at idling. Could this be the petrol injectors? They are the originals. I have been online though they seem to be out stock – Bosch article No 0 208 150 804.

Would a repaired one on eBay be OK? Hopefully you will point me in the right direction. Thanking you in anticipation.

Roger Price

A The code 232 is referring to the mixture and indicates that it is showing lean or rich in the exhaust at idle. This is as the O_2 sensor measures it and uses the reading to compare it to the air mass reading and the fuel meter reading.

Whilst this may be the result of a dribbling injector it can also be due to an air leak in the induction system or a faulty air mass sensor. This could also be the result of a failed O_2 sensor. The code does only show an incorrect mixture and not if this is lean or rich, which does leave the fault open to interpretation.

Given that this is a situation that occurs as the engine starts to warm up, I would first check the system for any induction leaks. As the Volvo does use LPG, I would check the areas around the LPG system to ensure that a leak is not present in any of these areas.

I would also check the exhaust to ensure that there are no leaks around the O_2 sensor or in the area of the sensor.

The code can also be set due to a fluctuation in fuel pressure, and it would also be worth ensuring that the fuel pump is delivering the correct pressure of 2.5-3.0 bar.

If the fault is in the injectors, then I would recommend getting these checked by mrinjectoruk.co.uk – they are a petrol injector specialist and should be able to test and service the injectors as required.

Diagnostics Doctor

Diagnostics Doctor is a **FREE** helpline service for *CM* readers – including trade readers – who are struggling with diagnostic/engine management related faults.

Steve Rothwell will answer all your queries. He will need as much detail as possible: **MAKE, MODEL, YEAR, ENGINE CODE** and **NUMBERPLATE** of your vehicle – and the type of management system installed. Obviously, Steve will not be able to assess the vehicle up close, so his answer will be on the basis solely of your description. This is a FREE service and it may take some time to respond to certain problems. If you would like to receive a personal response via post, please enclose an SAE.

e-mail:

cmdiagnostics@yahoo.co.uk

Write to:

DIAGNOSTICS DOCTOR
CAR MECHANICS,
KELSEY MEDIA,
THE GRANARY, DOWNS COURT
YALDING HILL, YALDING,
KENT ME18 6AL

Common abbreviations

ATS	Air Temperature Sensor
AFM	Air-Flow Meter – not a MAF type (see below). It could be, for example, a vane type
CAS	Crank Angle Sensor
CPS	Crank Position Sensor
CTS	Coolant Temperature Sensor
ECT	Engine Coolant Temperature
ECM	Electronic Control Module
ECU	Electronic Control Unit
EGR	Exhaust Gas Recirculation – meters exhaust gas back to the intake manifold
EML	Engine Management Light
EMS	Engine Management System
EPC	Electronic Power Control
FCR	Fault Code Reader
HT	High Tension – ignition output to the spark plugs
IAV	Idle Air Valve
ISCV	Idle Speed Control Valve – usually operated by a motor controlled by the ECU
LOS	Limited Operating Strategy – if the ECU detects a malfunction, it runs a programme to allow the car to still go, but at reduced efficiency
MAF	Mass Air-Flow meter
MAP	Manifold Air Pressure
MIL	Malfunction Indicator Lamp
PCV	Positive Crankcase Ventilation – takes crankcase gases and recycles back to the inlet system
TBPS	Turbo Boost Pressure Sensor – used by the ECU to regulate turbo output
TPS	Throttle Position Sensor
VSS	Vehicle Speed Sensor
WOT	Wide Open Throttle

Electronic Diagnostics

VW Beetle 2.0

Tracing and fixing faults in electronic engine management systems

PART ONE: In the first of a two-part mini-series, **Rob Hawkins** assesses several running issues and repairs on a troublesome VW Beetle.

“If it can’t be fixed, I’ll have to scrap it,” remarks motoring journalist Simon Goldsworthy and the current owner of the petrol-engined Volkswagen Beetle seen here. Despite a couple of reputable garages having attempted to fix a misfire and, in some cases, momentarily making a difference, the dreaded engine management light (EML) has always reappeared.

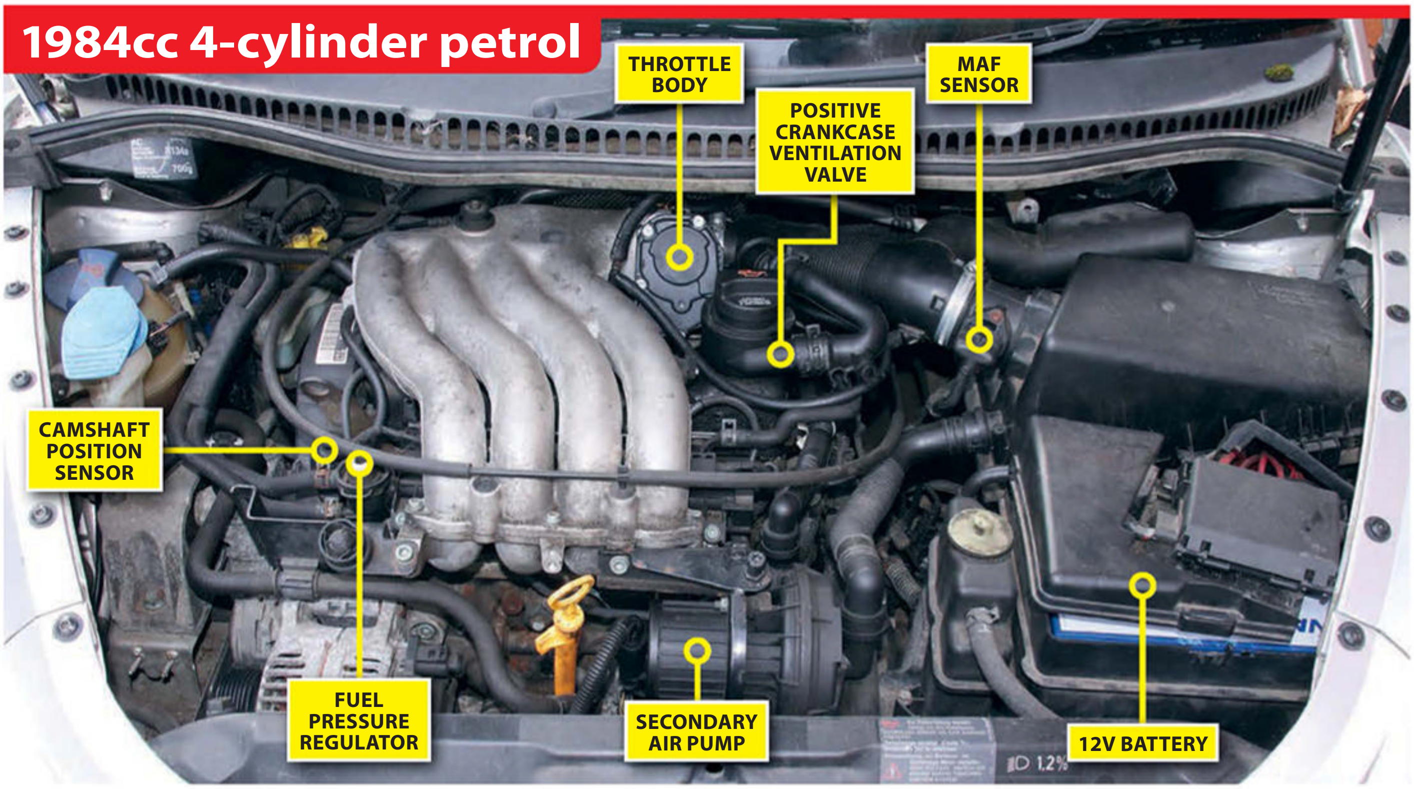
The trouble with a vehicle such as this 25-year-old Beetle starts with money. Unlike their air-cooled originals, these Golfs in disguise are not worth much and seem to sell for under £1000 (and closer to £500 in some cases).

The repair bills from the last two years, which list new components having been fitted, almost exceed this value, so Simon’s comments about throwing the towel in are plausible; there has to be a point when if it isn’t fixed, you have to walk away. At *CM* we’ve done this on many an occasion.

Our plan of attack began with Mark Shipman at AES York and the four receipts that outlined the repair work that had been done so far. Mark soon had a few questions, such as why the inlet manifold gasket had been replaced in June 2024 when during October the previous year, it had been removed to replace the spark plugs. Had the gasket been damaged in the process?

Simon’s notes on the problems he had discovered with his Beetle also helped to paint a picture for Mark. Armed with a Vgate fault code reader, he’d initially found problems relating to Bank 1 (the post-cat oxygen sensor) being too rich and too lean, an incorrect flow for the secondary air system and low voltage for the post-cat oxygen sensor.

The first repair bill noted fault code P0172 (Bank 1 too rich) and includes a



list of new ignition components (spark plugs, HT leads and a coil pack) having been fitted. Whilst it may have been the right time to replace the spark plugs (every 48 months, regardless of mileage), were the ignition components to blame for the fault codes? At the same time as changing the ignition components, the garage in question spotted the catalytic converter was on its last legs, so this was replaced with an aftermarket unit that cost a little under £150.

Simon recalls that after the ignition components and cat were replaced, the car was driven for a mere 50 miles before the EML illuminated. He returned to the garage, and they discovered a vacuum hose had split, so replaced it. They also noted on their receipt, "After resetting the EML I checked the fuel trim reading on live data and suspect it may have an injector/burnt valve issue. However, on running the car it may level its fuel trim out over time."

He ran the Beetle and after 40 miles, the EML came on again. His Vgate fault code reader had some new issues, relating to a misfire for cylinder number one, along with the fuel trim for Bank 1 being too lean.

Having lost faith in the first garage, Simon asked another one he knew well for a second opinion, and, in February 2024, they looked into the misfire and found two washers had been fitted to the injector for cylinder number one, so one of them was removed, which at the time fixed the problem.

Over the following four months, fault codes relating to Bank 1 being too lean and too rich returned, along with the efficiency of the catalyst being below the threshold. However, as Simon recalls, "It always seemed to run fine, with no obvious faults to help point the way. I would say that there was a momentary roughness when it was first started, but whether or not this was normal as the electronics found their feet, I have no idea."

A final attempt was made to fix them by returning to the second garage, who diagnosed issues with the PCV valve, inlet manifold gasket, the seal for the oil filler cap and the throttle body! All these parts were replaced, and a road test is noted on the receipt to say all was OK.

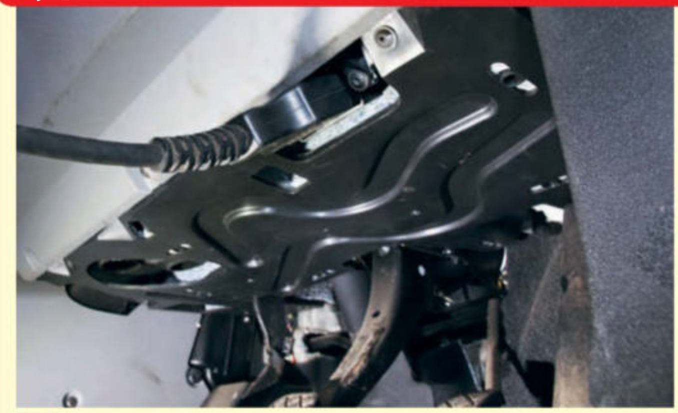
Unfortunately, the EML once again returned after some 50 miles of driving, listing those Bank 1 fault codes relating to being too rich and too lean.

In February 2025, *CM* volunteered to help, collecting the Beetle and consulting Mark Shipman at AES York, who connected his diagnostic equipment to double-check the logged fault codes, which were as Simon had described. He then suggested checking the work that had been conducted, starting with a smoke test of the induction system. As you'll see in our steps on the final page of this feature, we had to replace the oil filler cap's seal again.

Mark wondered whether the catalytic converter was to blame for the logged fault codes, questioning whether it was warming up quickly enough and more importantly, getting up to optimum efficiency in the time limit that's set by the ECU. A genuine cat is often more efficient at achieving its operating temperature and optimum efficiency because the ceramic internal components warm up quickly. A cheaper aftermarket cat may have steel internal components, which don't warm up so fast.

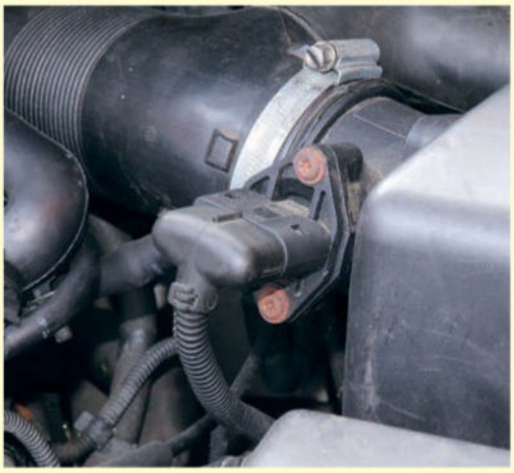
To see if this was the case with the Beetle, we visited our local MOT testing station (MJ Motors). Conveniently,

Typical VW BEETLE COMPONENTS



1 **The EOBD port for connecting diagnostic equipment is underneath the driver's side of the dashboard, close to the inside of the A-post.**

2 **In the nearside of the engine bay, there's the 12V vehicle battery and a main fusebox. Check the battery's terminals are clean and secure. When using diagnostic equipment, connecting a booster pack to the battery will help to reduce the risk of voltage drops and anomalies. This Beetle's battery was renewed in June 2024.**



3 **◀ The air filter housing is next to the battery and the paper element air filter inside it should be replaced every 40,000 miles or 48 months. Attached to the feed hose from the housing to the throttle body, there's a mass airflow (MAF) sensor.**

4 **▶ It's useful to know the engine code to help narrow down any diagnostic work. We found a sticker on the timing belt cover, which states this Beetle's engine code is AQY. We could also see that the timing belt had been replaced in May 2023 – it should be replaced every 48 months, regardless of mileage.**

after having cleared all the fault codes, the EML remained off until a mile or two before arriving at the test. The logged faults included Bank 1 (the post-cat oxygen sensor) being too rich and too lean and the cat being below its threshold. If anything was consistent, it was these fault codes.

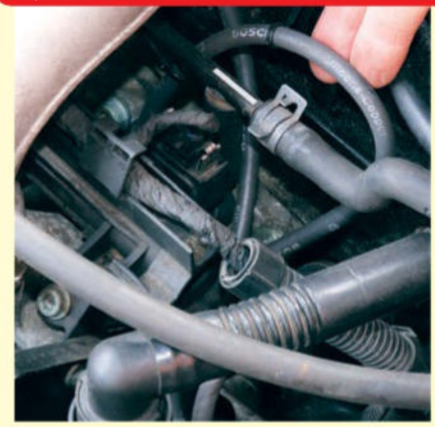
With the engine and cat suitably warm, an emissions test was conducted, which revealed the carbon monoxide (CO) reading was close to the limit and at times varying along with the engine's rpm. However, the emissions test was passed, which proved that the cat's condition was good enough to pass an MOT test, but the time limit set by the ECU to warm it up and expect low emissions was too short for our non-genuine component. However, after relaying this to Simon, he explained, "This EML has been an ongoing problem for many years (the previous owner tried all sorts to cure it without success) and so it also happened when the previous – and possibly original – cat was fitted, meaning it is not caused specifically by this cheap aftermarket cat."

Our puzzle will continue to unfold in the next issue of *CM* when we discover a collapsed vacuum hose, try fitting a spacer on to the post-cat oxygen sensor and wonder why a readiness test raises a varied list of failures.

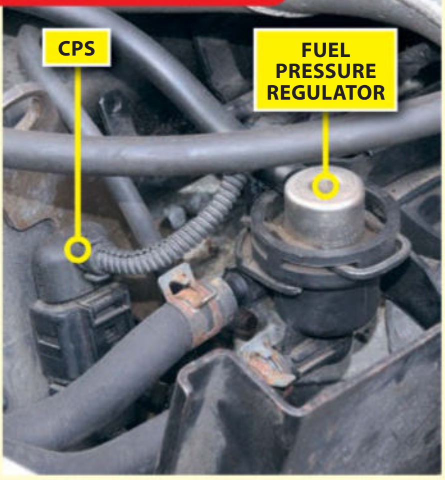
THANKS TO
AES York Limited
01904 780149
autoelectricsyork.co.uk

MJ Motors
01924 472404

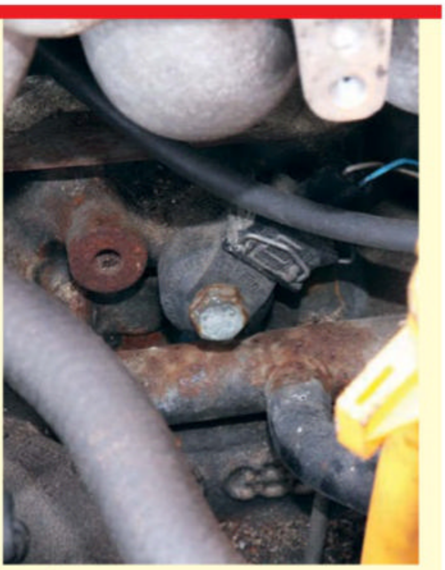
Typical VW BEETLE COMPONENTS



5 **With an aluminium inlet manifold routed across the top of the engine, access to the spark plugs requires its removal. Looking at the garage receipts, this Beetle's coil pack, HT leads, and spark plugs were all replaced in October 2023 in an attempt to resolve a misfire. The spark plugs should be replaced every 40,000 miles or 48 months.**



6 **From the offside front corner of the engine bay (close to the timing belt cover), there's a fuel pressure regulator, a camshaft position sensor (CPS) that's attached to the timing belt cover and the fuel rail and injectors can be seen underneath the inlet manifold.**



7 **Attached to the engine block and visible from the front of the engine bay, there's a knock sensor. This detects excessive engine vibration, often caused by defective spark plugs and using the wrong fuel.**

8 **◀ There's a cable-operated throttle body at the back of the engine bay. This was replaced in June 2024, along with the oil filler cap's seal, Positive Crankcase Ventilation (PCV) valve – part of the oil filler neck where the cap is fitted – and the inlet manifold gasket. New throttle body assemblies are available from febi.**

9 **▶ Viewed from the front of the engine bay, there's an air pump for the secondary air system. It feeds fresh air into the exhaust system to help with warming up the catalytic converter. If there's a problem here, it won't cause any running issues, but it will raise a fault code because the catalytic converter may not be reaching its optimum efficiency within the time limit set by the ECU.**

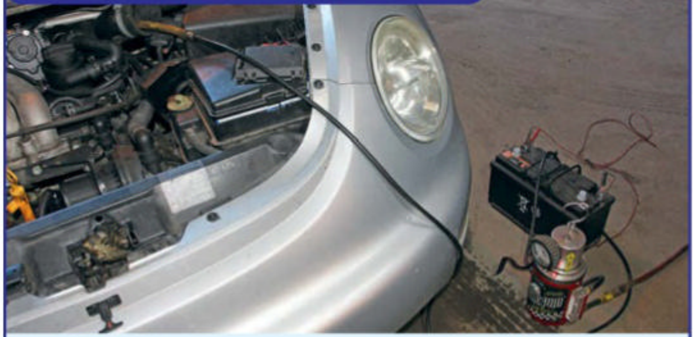
TECHNICAL SPECIFICATIONS

Engine	1984cc 4-cylinder single overhead cam petrol
Engine oil grade	0W-30, 0W-40, 5W-30, 5W-40, 10W-30 and 10W-40 (recommended grades are dependent on climate)
Oil classification	VW 501.01, 502.00 and 503.00
Oil capacity/schedule	4 litres with filter every 10,000 miles or 12 months

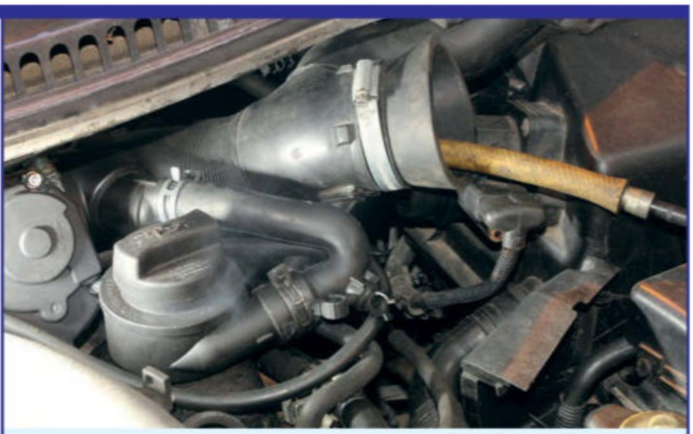
TORQUE SETTINGS

Sump drain plug	**30**Nm
Spark plugs	**30**Nm
Oxygen sensor	**50**Nm
Knock sensor	**20**Nm
Road wheels	**120**Nm

FIXING THE FAULTS



With the Beetle at AES, Mark suggested conducting a smoke test to see if there were any leaks in the induction system. Using his smoke detector, the hose between the air filter housing and the throttle body was detached to feed smoke in.



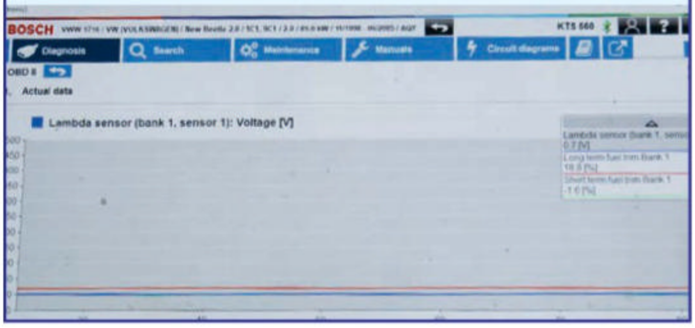
Smoke soon started to emerge from the oil filler cap. This had been replaced in June 2024, but there was clearly an issue with the new part that had been fitted, or so we thought.

We acquired a new oil filler cap from febi, checked it was identical to the old one it was replacing, then fitted it and connected the smoke detector once again. To our surprise, smoke still leaked out around the new cap.

Pushing down on the filler cap stopped the smoke from leaking out, so we concluded the filler neck, where the cap is attached, must have become worn. We tried a little rubber grease around the seal, but this didn't help.

Our next solution was to fit the rubber seal from the old filler cap on to the new one, doubling up on the seals. This time, after another smoke test, no smoke emerged from around the oil filler cap.

Feeling moderately positive, Mark connected his diagnostic equipment and examined the long- and short-term fuel trim data to see if the difference between the two figures (when subtracted) was within the 10% recommended parameter. It wasn't – it was near 18%.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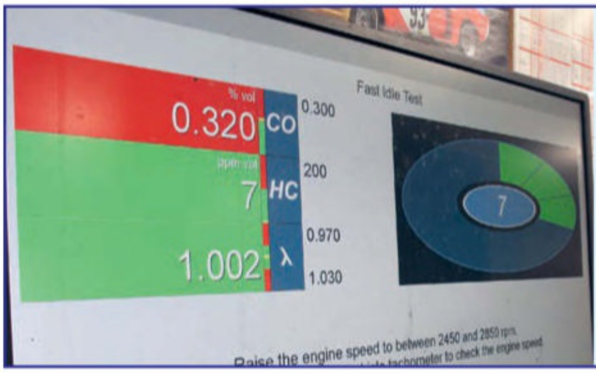
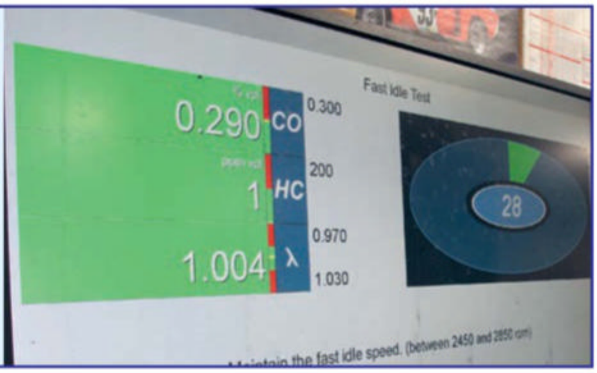
OBD II
Actual data
Lambda sensor (bank 1, sensor 1): Voltage [V]

Suspecting the aftermarket cat wasn't warming up quickly enough and thus causing some of the fault codes, we visited our local MOT testing station to conduct an emissions test.


Fast Idle Test
% vol
0.320
CO
0.300
ppm vol
7
HC
200
1.002
λ
0.970
1.030
7
Raise the engine speed to between 2450 and 2850 rpm

The fast idle test showed that the CO reading was occasionally rising above the MOT test limit, but eventually it was low enough to pass. The HC and Lambda readings proved there were no defects with the cat.


Fast Idle Test
% vol
0.290
CO
0.300
ppm vol
1
HC
200
1.004
λ
0.970
1.030
28
Maintain the fast idle speed. (between 2450 and 2850 rpm)

Our Cars

Andrew Rolland

Special Contributor

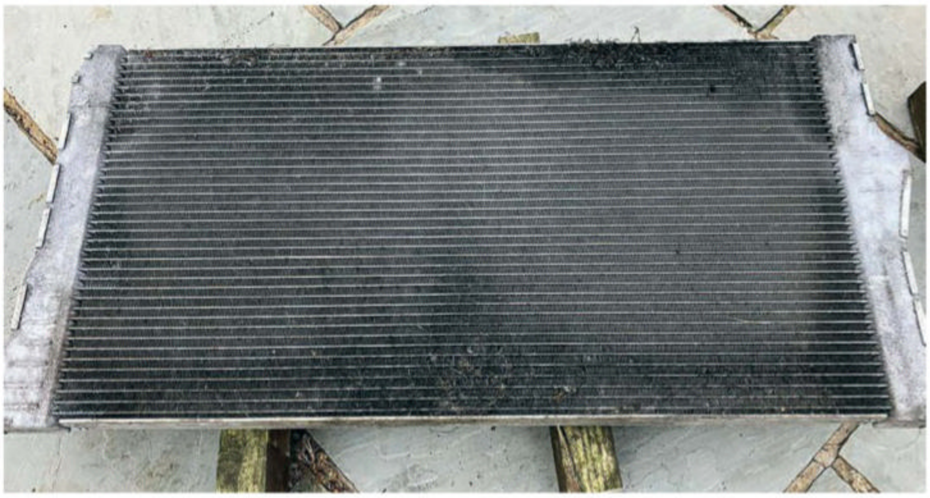
Hot & bothered

The electric water pump on my 2013 BMW F10 535i was refusing to work properly. It all started with the electric cooling fan running at speed immediately on starting the engine first thing in the morning. It shouldn't be doing that, but I needed to get to work. I can hear the fan kick in and out in traffic which is unusual. Then, while just toddling along at 50-60mph on the motorway keeping up with the traffic flow, I get an unwelcome and alarming yellow warning on the dash, "Engine temperature high". Oh bother. I suspect that's linked to the fan's unusual behaviour. I see an exit to leave the M77 and I know there's a supermarket car park just a few hundred metres away where I can park up and be safe while I deal with the problem. As I coast down the slip road, the yellow warning turns red "Engine overheated". Oh bother, bother, bother! Within seconds it returned to the yellow warning. Throughout this drama the engine oil temperature gauge is still on the cold side of vertical where it normally sits.

Bracing myself for impending doom of oil, coolant and steam coming out from the engine, opening the bonnet reveals nothing out of the ordinary. I have coolant so that's OK. But weirdly the radiator was stone cold. Car thought the engine was too hot, yet it would appear the thermostat had not opened. Strange. I let the engine cool, and I run the electric water pump using the ignition on/headlights on/floor the throttle trick and I can see the oil temperature gauge dropping as the coolant circulates. I drive the last few miles to work with the heater up full and park up with the fan running again at full speed. Radiator is again stone cold. Something's clearly not right.

That lunchtime I order up a replacement OEM thermostat and febi temperature sensor, with a two-day delivery all for under £60. I then recall the party trick in my BMW where you can access a hidden dashboard menu which will give you the option of displaying both oil and water temperatures. I drive it home gingerly watching these

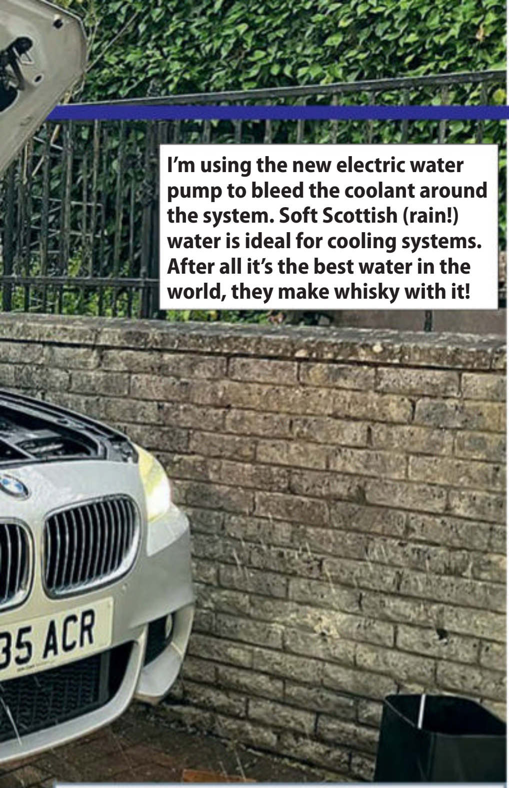
With his Mechanical Engineer skills honed over many decades, my dad unscrews the corroded radiator fixings much to my relief.



The radiator was in desperate need of a clean, the external fins were chocked with organic debris, however the internals when flushed, ran clear.

More than 48,000 different spare parts in OE matching quality

febi bilstein



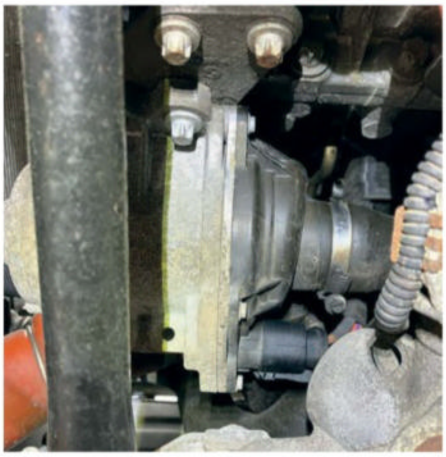
I'm using the new electric water pump to bleed the coolant around the system. Soft Scottish (rain!) water is ideal for cooling systems. After all it's the best water in the world, they make whisky with it!

IN ANDREW'S GARAGE

2015 Ford Kuga 1.5i AWD 10-years-old with a few big ticket items to sort out, timing belt, four tyres, rear brakes and an annoying door lock problem.

2013 BMW 535i My daily driver has been clocking up the miles due to work commitments, so it needs some new parts fitting, watch this space.

The shiny new all-metal febi pump. An upgrade on the plastic one that has just failed. I've stripped out the radiator, fan and cross-brace to make access.



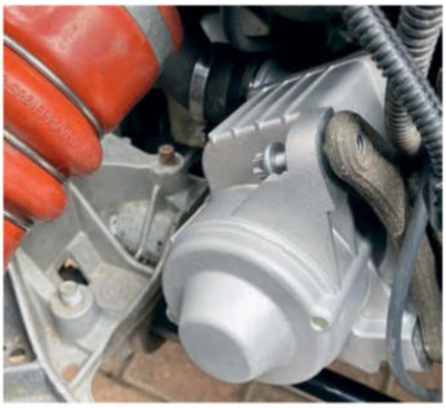
The water pump is fixed to the side of the block, below the intercooler hose, above the anti-roll bar and just to make access harder, the hoses and electrical connector are above the steering rack!

temperatures and all was well. No EML ever came on, but given the dash resembled Blackpool illuminations early that day, I plug in my code reader as there must be a code logged. And sure enough, a trouble code telling me the pump speed was outside tolerance. I clear the codes, take it for a drive, recheck codes and it reappeared. With the pump confirmed as kaput, I can't risk driving it as these engines, if overheated, are only good for making into beer cans. *CM* readers may remember a buying guide for a BMW 135i (with the same engine as my 535i) where it was said that electric water pumps and thermostats are known weak points. Well, I can confirm that.

I need a water pump fast as I need the car for work, so with Editor Knowles's help, an SOS was sent to febi for a pump. I start the strip down while I'm waiting for the parts to arrive. This gives me a chance to work out how I'm going to do this job. As I've got a few spare radiator hoses to fit, I make the decision to remove the radiator which will give me more room to access the pump and thermostat but also a chance to flush it internally and clean it externally.

My dad arrives to lend me some moral support and advice, which was much needed when I ran into corroded screws holding the radiator fixing brackets. These are buried deeply down the side of the radiator and were stuck fast. A set of long Torx screwdrivers were needed. Thanks to a well-known company named after a river, I was in possession of said screwdrivers in less than 24 hours and within minutes my dad had worked out the corroded screws. Access to do this job is the key, while it looked like there was lots of room, there wasn't for my hands to get into the small spaces to work the hoses off their connections – but with patience in removing and refitting parts in a specific order, and a few lifesaving tools, I got there.

By inserting a pick tool under the pump inlet hose, I'm able to free it from the old pump, while trying not to get wet! This pump lasted 67,400 miles.



The new febi pump (p/n 178011) in the process of being installed in bowels of the engine bay, it was surprisingly easy to install the outlet hose on the pump. The hose clamp was then tightened from underneath.

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Our Cars

Steve Rothwell

Technical Editor

MINI for a learner

My grandson, when he turned 17, had decided that a motor scooter was going to be his preferred method of transport. He had completed his CBT course and with a scooter purchased he was ready to go. After a few wet winter days, he decided that perhaps learning to drive would be a better option.

My Honda CR-V automatic would not be a good choice, and his parents motor is also a large Nissan and not suitable for a first-time driver.

As luck would have it, the perfect vehicle appeared in the workshop in the shape of this 2009 MINI Cooper D 1.6. The annual road fund licence is £20, and it is a perfect size to learn on.

The motor came in with a failed footwell module, which had given up the ghost after the owner had helped a friend with a jump-start. The resulting surge in current as the mate's motor started and roared into life caused a failure of the MINI's footwell module and this was now resulting in a problem with the headlamps and indicators along with a fault causing the electric windows to become erratic.

TORQUE SETTINGS	
Track rod ends	**65**Nm
Brake disc to hub	**27**Nm
Brake caliper carrier to hub	**110**Nm
Brake caliper to carrier	**35**Nm
Thermostat housing	**10**Nm
Road wheels	**140**Nm

When the MINI appeared in the workshop with a few problems it seemed a perfect buy for my needs.

There were a couple of other bits that would need doing before the next MOT which was due in just under ten weeks – and the owner had decided that after a recent splash out on a new injector, they had spent enough money on this little MINI, and decided to call it a day.

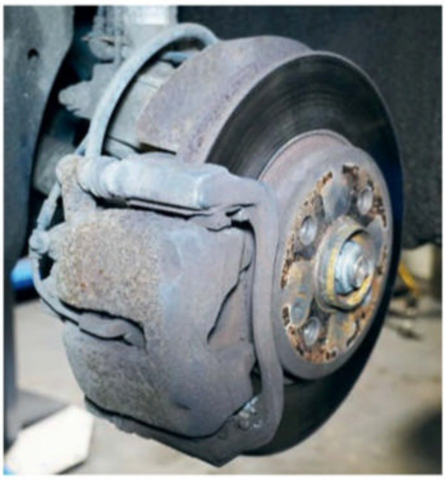
After negotiating, I managed to bag the MINI for £200. I decided that this was the perfect vehicle for my grandson to learn in. Knowing the history of the MINI, I was aware that the clutch had been replaced 18 months ago and the timing belt just over two years ago making it a good choice.

The first step was to remove the footwell control module and send this for repair – a local one-man band who has the required equipment was willing to do this for just under £40 – and so removing the module I sent it off.

The reset with the correct equipment is apparently just a case of retrieving the information from the unit, wiping the memory and re-writing the software, before then writing the vehicle coding back to the module. All this is achieved by a simple program but does require the specialist tool to do so.

The module was returned less than four days later – and once plugged in – all the functions returned, proving that the reset had been successful. With a running and functioning vehicle the

The febi bilstein parts were unpacked and ready to be fitted.



The old discs and pads were worn, and although the brake pad wear indicator had not quite reached the point of touching it was a good time to replace the brake discs and pads.

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IN STEVE'S GARAGE

2013 HONDA CR-V 2.0 PETROL

Purchased in 2016 when just over three-years-old, it has been a reliable motor and needed only routine maintenance including tyres, oils and filters along with brake discs and pads.

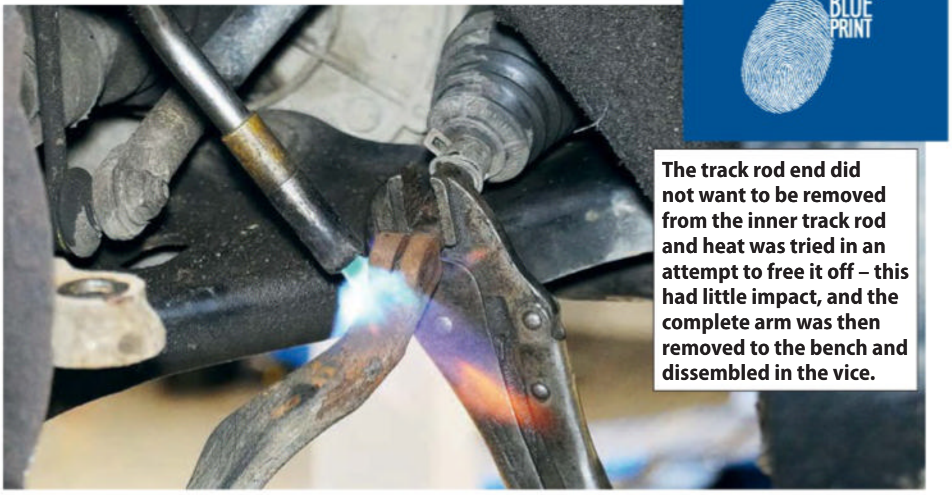
next step was to sort out some of the mechanical faults.

New brake discs and pads were required, along with both inner track rod arm which were showing quite a bit of wear allowing the steering to judder as the MINI drove along the road. The parts were ordered from febi bilstein and arrived a day later.

The fitting of the brake discs and pads went smoothly, and all the bolts came undone as I had hoped. The next job was the inner track rod arms, and so starting with the offside, the first obstacle I came across was the offside track rod end which did not want to be detached from the inner track rod arm.

A little bit of heat was applied in an effort to ease the track rod from the inner arm, but this still did not allow the separation of the two components. The next step was to disconnect the inner arm and then put the complete assembly into the vice. This did the trick, and the track rod was soon separated from the inner arm.

With the febi parts fitted and both sides back together, the tracking was carried out and set to 2.92mm before resecuring the steering rack gaiters. The improvement in the steering was soon noticed.



The track rod end did not want to be removed from the inner track rod and heat was tried in an attempt to free it off – this had little impact, and the complete arm was then removed to the bench and dissembled in the vice.

The new inner track rod arm was fitted before sliding the rack boot back in place and refitting the track rod end.

When the tracking was set it was initially a long way out, indicating that either my counting 'on and off' of the track rod ends was incorrect, or that the new inner arms were a slightly different length. This was soon rectified and the tracking correctly set.

The next step was to rectify the coolant leak that I had spotted from around the thermostat housing. A febi 'stat was fitted – and comes complete with the new gasket seal. Access to the housing is good and once the fuel filter, fuel filter bracket and air filter housing had been removed, the signs of the escaping coolant were visible, confirming the area of the fault.

The offside went a lot easier and the track rod end was easily disconnected, allowing he boot to then be fully removed before unscrewing the inner track rod.

The footwell module is easily accessible and once sent for repair the initial electrical problems were resolved.

The outlet has several hoses and these all needed to be disconnected, and the cooling system drained down before removing the four securing bolts. With the cylinder-head face cleaned, the new thermostat housing could be fitted and

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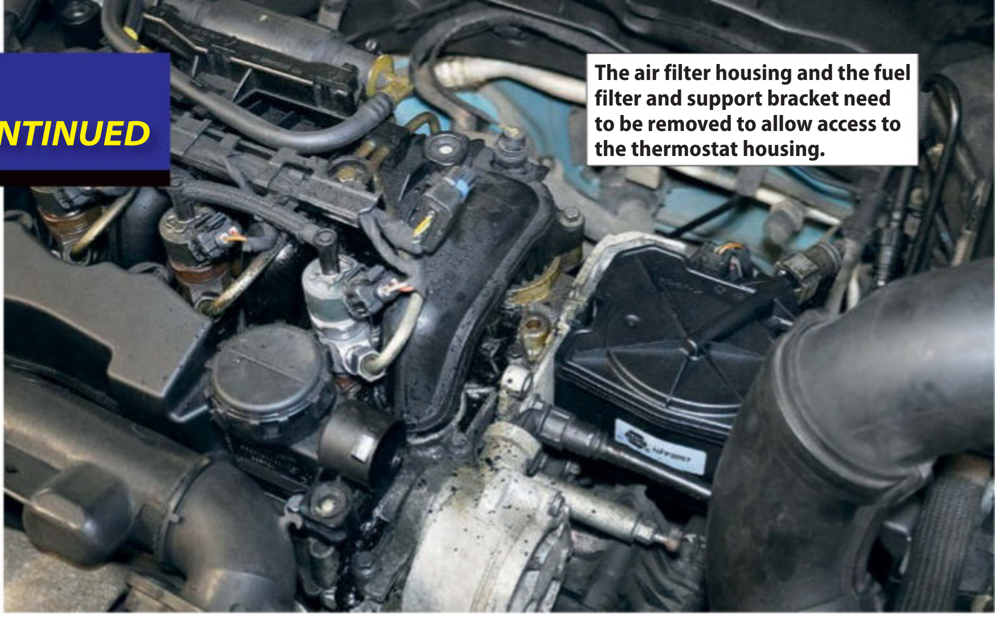
Our Cars CONTINUED

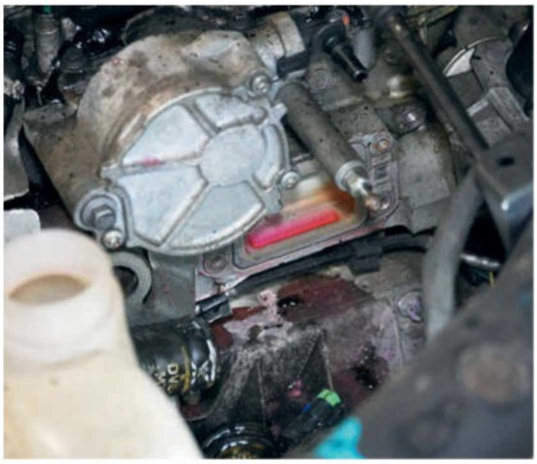
torqued to a setting of 10Nm. The hoses were reattached and the cooling system topped up with fresh coolant.

After refitting the fuel filter and support bracket, the engine was then run up to bleed the cooling system through, allowing the thermostat to open before replacing the pressure cap.

A quick run on the road confirmed that the earlier shudder from the steering from the worn inner track rod arms had now gone, and the brakes also felt smooth and efficient. The MINI was now ready for the grandson's first lesson.

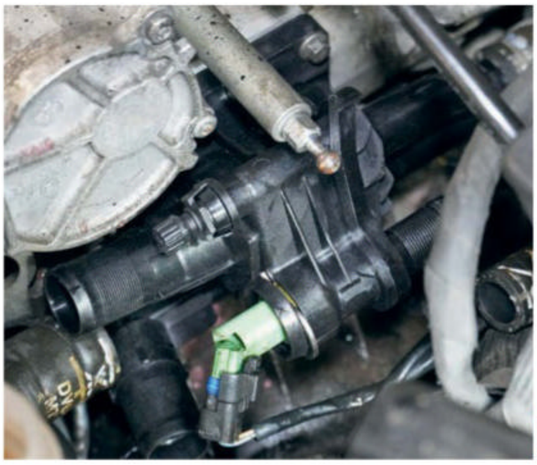


The air filter housing and the fuel filter and support bracket need to be removed to allow access to the thermostat housing.



◀ Once the fuel filter was removed the housing and the pink stain signs of escaping coolant could be easily spotted. With the old housing off, the area and the face of the cylinder-head was cleaned ready for the new housing to be fitted.

▶ With the new febi housing in place, it only remained for the hoses to be connected and the fuel and air filters to be fitted back in place. Once all back together the engine was run up with the pressure cap off to bleed out the cooling system.



CAR MECHANICS NEXT MONTH

Jaguar Land Rover Ingenium engines

ARE THEY AS BAD AS THEIR REPUTE SUGGESTS?

- ▶ Overview of the Ingenium engine family
- ▶ Knowing the subtle differences
- ▶ Buying the right one
- ▶ What goes wrong?
- ▶ Engine rebuild covered
- ▶ How to prevent problems from occurring in the future
- ▶ General tips on picking a top engine remanufacturer

JULY 2025 issue out JUNE 20th

Mercedes Citan MODIFICATIONS

- ● PROJECT FORD FOCUS SUSPENSION
- ● PROJECT MAZDA MX-5 ALLOY WHEEL REFURB/NEW TYRES
- ● BUYING A CHEVROLET CRUZE
- ● VW BEETLE 2.0 DIAGNOSTICS (part 2)

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CARS FOR SALE

PEUGEOT 106 ZEST 3 DIESEL. 1998. 3-door. No MOT. 127,000 miles. One owner since 2001. I'm delaying sending it for scrap in case someone wants it! **£200**. **07484 157604**. Hereford.

ROVER 214 SLi. 1995. One owner since 2002. MOT to 2026. Some spares. Reason for sale, had to give up driving. **£1400**. **01909 480891**. Notts.

ALFA ROMEO BRERA 2.2 JTS SV. **£1000**. 2007. Intermittent fault which causes it to sometimes run on 3 cylinders. Otherwise, drives well. Front subframe, clutch/flywheel, rear suspension arms, rear shocks, front discs, all sorted. **07968 649872**. East of England.

ROVER 820si. 1996. 10 months MOT. All belts done. 68,000 miles, new battery & radiator, minor TLC will make perfect. **£2000**. **07791 935511**. Liverpool.

MERCEDES BENZ S-CLASS 280. 2004. One lady owner from new. 77,000 miles. MOT until August. Metallic silver with black leather. Stunning unmarked condition. **£3995**. **07904 429655**. London.

MAZDA MX-5 Mk1. 1992. Eunos Roadster. Red. Built 1992, imported 1998. 98,800 miles. MOT to July 2025. One owner since 2007. All bills for maintenance. **£2600**. **01763 838936**. East of England.

MISC

NUMBERPLATE FOR SALE – DAD 792. **£1495** or best offer. **07824 507475**.

BMW 530d M-SPORT. Automatic, 2003. MOT November. Full service history, 148k miles, heated leather interior, electric sunroof, xenons, etc. Owned by BMW car club member since 2018. **£2995**. **07403 873338**. West Yorkshire.

JAGUAR S-TYPE V6 SE Auto. 2002. Very good overall condition, 71,400 miles. 2 owners. Good tyres/alloys. 10 months MOT. Royal Blue, Biscuit interior. Many MOTs. Serviced by Jaguar and independent mechanic. **£3750**. **01789 740403**. Warwickshire.

MAGAZINES

CAR MECHANICS. 271 issues dating from November 1985 to December 2023. 14 issues dating from September 1963 to November 1975 (6 of these have the front & back cover missing). There is also a copy of *Car Mechanics Auto Help* (dated April 1988). 65 issues of *Practical Motorist* dating from November 1969 to August 1997. 18 issues of *Popular Motoring* dating from April 1966 to January 1976. 16 issues of *What Car?* & *Used Car Buyer* dating from May 1968 to September 2002. Sensible Offers considered for Job Lot. **07510 544912**. Essex.

CLASSIFIED DEADLINE for JULY 2025 issue: June 4th

In my Humble Opinion

Mike Humble wants to buy a car – seemingly nobody wants to sell him one.

Slack sellers & dozy dealers

▶ I did something a little while back that, historically, I've always advised folk not to do – no, not that you dirty minded so and so, but sourced a car totally unseen. Well, when I say sourced unseen, I did once buy a spares or repair SAAB 9-3 but that was laughably cheap, relatively local and I knew what I was letting myself in for beforehand. I am in fact talking about my Vauxhall Grandland X of which they'll be an upcoming service report in the *Our Cars* section in the not-too-distant future. It was offered on a lease deal at a very good price that nobody locally could match, and I needed some wheels like yesterday. I know the outfit that was dealing with me, it was a one owner car, they sent me loads of high-quality images with two videos and answered all the questions I asked pronto. All in all, it's gone very well, and I am more than happy how things have panned out.

The nearest physical contact with the vendor has been a few phone calls and a solid handshake from the man who delivered it from Yorkshire down to my gaff in Sussex. Being a lease car (PCP), time has quickly come round again to either pay the balloon payment and keep it, or, hand it back, say ta-ta and find myself something else via them or by my own sourcing. After a while of thinking, I have decided to go for the latter and regardless of the fact it's been a cracking car, I fancy something bigger and not necessarily another SUV. When buying cars new or used, I've always been 'old school' when it comes to the process. The current motor couldn't be beaten down on cost, I'm no fool when it comes to value and besides, it would have been pointless not to say embarrassing to even try to haggle. My usual way is to trade 'Zulu' style, in other words – when you can see the whites of their eyes.

> *"Physical contact either in person or on the phone, in my opinion, remains THE best way of dealing before you hand over the cash"*

Too much texting

Physical contact either in person or on the phone, in my opinion, remains THE best way of dealing before you hand over the cash. Yet it seems these days people are not only getting sloppy and lazy when buying, but when selling as well. My thought was to get something now if I spot an ideal candidate, SORN it until I need it and so on. So a few enquiries have been put out for a decent new(ish) second-hand car. Two such vehicles (a SAAB and Honda Accord) tickled my fancy and were being offered via a well-known social media channel. The SAAB owner only wanted to deal via messaging and despite myself warning them they would only get a sale by stepping up to the plate and talking to me, they wouldn't come from behind his computer screen. The problem is you cannot ask or receive proper questions and answers through typing. They wanted to do the Q&A bit via text and then meet up to trade. I ask you, you try and do that before you get thoroughly p!ssed off after the eleventh message – at ten at night.

The whole idea of a conversation is to assess risk. Namely, if the car is a long way away and it turns out to be a dog, you've wasted half a day and a tank of fuel. If it sounds too good to be true or the answers don't match your verbal expectations, you simply say no thanks, hang up the phone and go back to watching Emmerdale and nobody has fallen out – who gives a damn about someone you've never even met? The Honda was with a dealer group that had one of those chat boxes in the corner. After a minute of browsing, a rep popped up and asked if they could help – at well gone 6pm. I was momentarily impressed. There were three other motors besides the Accord so I asked two or three standard opening gambit questions and mainly wanted to log an interest and book a call from them to talk turkey. After a short while the message came back to say they couldn't answer me there and then, place my email, contact number, vehicles of interest and they will promise to return my call tout suite.

A few days later I received a phone call from some young lad from said outfit who started a diatribe of baloney about some Ford Galaxy. He was quickly stopped. I told him it was a diesel Honda Accord I was looking at, only to be asked, "oh do you know where on our site that is?" He faffed around for about five or ten minutes trying to find the car. Feeling my heart slowly break and losing patience, I suggested he go back to the enquiry log, recall the data and call me back – that was almost two weeks ago. Two other dealerships never even bothered to return my calls which has left me wondering whether nobody actually wants to take my money despite the finances being in place and ring fenced – in my dealer days we would call this sort of customer "hot to trot" and act with swift efficiency.

So, once again, my mindset is one of slack sloppy vendors, and dealerships. This is not only rubbish – it's criminal. Dealer groups, well, some of them, are always the first to bleat about how hard they are done by when times are tough yet learn bugger all from their experiences. And yet when a fina bode (tugs forelock to Arthur Daley) customer comes along – they still balls it up.

So, imagine my surprise two days ago sitting here on the veranda of a Canarian villa just about to jump in the pool, my mobile shatters the peace and the sound of the waves crashing over the rocks.

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